



Diversity of Few Selected Arthropods Fauna in Kanai Chatta and Adjoining Coastal Belt, Purba Medinipur, West Bengal.

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Abstract:-The present study was carried out in Kanai Chatta and adjoining coastal area of 545 acres area from April, 2020 to December, 2021. The area is a transitional zone of aquatic and terrestrial ecosystem. Where 114 species of spiders under 20 family; 102 species of butterfly under 5 family; 43 species of odonates under 5 family; 35 species of moth under 9 family; 9 species of mantis under 3 family and 18 species of crab (Decapods and Xiphosura) under 6 family was recorded from this region. Whereas two butterfly, *Hasora badra* under hesperiidae family and *Amblypodia anita* under lycaenidae family and one odonates, *Paragomphus lineatus* under Gomphidae family was recorded first time from Purba Medinipur district.

Key words: - Arthropods, Kanai Chatta, spider, butterfly, odonates, crab, conservation, Purba Medinipur.

Introduction:-

Marine-coastal - estuarine- mangrove ecosystem represents the most productive and dynamic ecosystem of the world. It supports innumerable number of flora and fauna in its diversified habitats and ecological niches (Chakraborty 2017). Invertebrates are a major component of faunal biodiversity. This group is one of the most diverse and structure a key constituent in terrestrial ecosystem (Stork *et. al.* 2015; Kaur *et. al.* 2020). Invertebrates comprises most animal biodiversity and biomass on earth and dominate all ecosystems (Wilson 1988; Gaston 1991; Grodsky 2015). Invertebrates represent more than 90% of the world's estimated 10 million plus animal species (Wilson, 1992; Barua *et. al.* 2012). Invertebrates occupy the greatest breadth of ecosystems, microhabitats and niches among animals and assume key ecological functions among myriad trophic level, effecting soils, plants and vertebrates (Collins & Thomas 1991; Grodsky, 2015). They are crucial components of food webs and fulfill many ecosystem services, such as pollination, decomposition and nutrient release (Prather CM *et. al.* 2012; Morley, 2014). Different groups of invertebrates provide biological control of crop pests. In many situations, they form the basis of, and tools for, the integrated pest management (IPM) approach (Cock *et. al.* 2012). In recent meta-analysis of over 2000 terrestrial mammals, invertebrates were most common food types that consumed by a majority of species (53%) (Kissling *et. al.* 2014; Bergstorm *et. al.* 2019). Removal of invertebrates species can lead to changes in diversity and modification to ecosystem function (Mulder *et. al.* 1999; Morley, 2014). Now-a-days, Invertebrates conservation is facing a several great challenges, those are firstly, research is disproportionately low compared to the number of invertebrates taxa present (Clark and May, 2002; Barua *et. al.* 2012). Second, invertebrates are often considered pests and have low public conservation profiles (Berrenbaum, 2008; Barua

et. al. 2012). Third, conservation status of less than 1% of the insect species described has been evaluated (Warren *et. al.* 2007; Barua *et. al.* 2012).

There was no separate published research paper from this particular area before this study. Few papers (Giri *et. al.* 2021; Jana *et. al.*, 2021; Dwari *et. al.* 2020; Payra *et. al.*, 2019; Roy *et. al.*, 2019; Pahari *et. al.*, 2019; Hazra *et. al.*, 2018; Pahari *et. al.* 2018; Mitra *et. al.*, 2017; Mondal *et. al.* 2017; Chakraborti, 2017; Patra *et. al.*, 2017; Das *et. al.*, 2016; Mandal *et. al.*, 2015; Jana *et. al.*, 2013) has been published from Purba Medinipur coastal belt on various invertebrates fauna.

Our present study is aimed to contribute to our understanding of the Arthropods fauna within a small area. Hence, we documented the few selected invertebrates faunal diversity in that particular study area.

Materials and Methods:-

Study area:-

State West Bengal is the coast line touched states among another 9 states in India, located in eastern India along the Bay of Bengal, extends from 22.9868°N to 87.8550°E, total covering area 88,752 km² of our nation, India. Total covering area of coastline of west Bengal is 158 km, out of total 7516.6 km coastline in India, where 2 districts of this states is situated in coastal region, i.e.- East Medinipur, South-24-Parganas. Where our present study was carried out in Kanai chatta and adjoining costal belt of Purba Medinipur (21.9373°N 87.7763°E) district is a part of lower Ganga plain (Figure - 1). East Medinipur district is surrounded by Bay of Bengal in southern part of the district. The coastal area of East Medinipur district is more than 60 km in length, representing 27% coastal environment of West Bengal (21°30' N to 22°2' N; 87°5' E to 88°5' E). Present study area is located between 21°47'14.41"N and 87°52'34.47"E and total 9.62 km length out of 60 km in length coastal area and total 545 acres area. In summer days (March to June) temperature of this region range from 30° to 38°C and in winter (November to February) temperature ranges from 15° to 25°C. Monsoon generally starts from the first week of June and extends up to October. Average annual rainfall is 1,700 mm. The habitat of this study area is mainly a fresh water wetland and adjoining coastal belt. The vegetation of this study area is mostly dominated by few mangroves like *Avicennia alba*, *Aegiceras corniculatum*, *Bruguiera gymnorrhiza*, *Ceriops decandra*, *Excoecaria agallocha*, *Avecennia marina* and *Rhizophora mucronata* and dominated trees are *Casuarina equisetifolia*, *Acacia auriculoformis*, and *Acacia nilotica* and associated grasses are *Fimbristylis barbata*, *Porteresia coarctata*, *Acanthus illicifolious*, *Pandanus odoratissimus*, *Sesuvium portulacstrum* and *Suaeda maritima* were found.

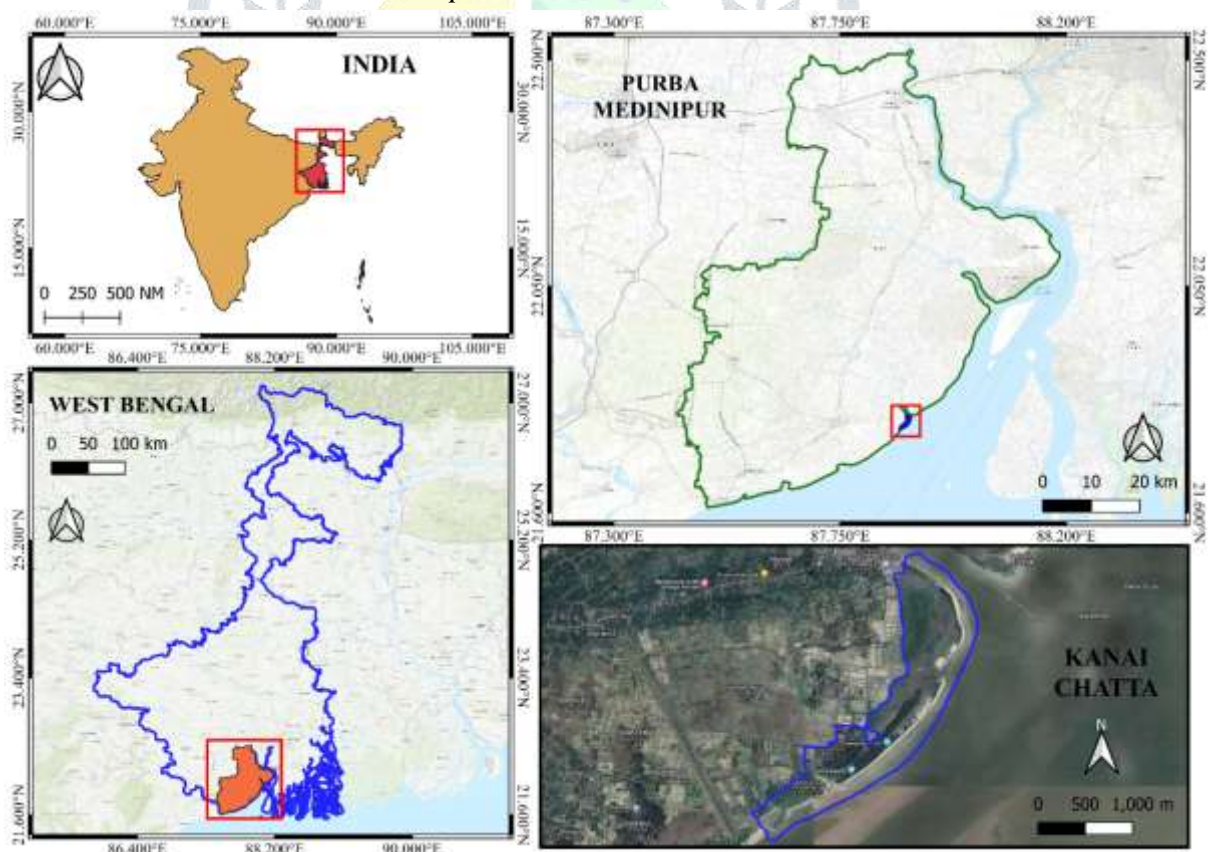


Fig-1:- Figure shows the location of the study area.

Sampling methods and identification:-

The present study were carried out from April, 2020 to December, 2021. We were recorded few selected arthropods fauna those are Spider, Butterfly, Moth, Odonates, Mantis and Crab. Field Photography was done by Nikon coolpix p900 camera.

For spider sampling, we were used various sampling techniques viz. hand picking, vegetation beating, ground hand picking, pitfall traps etc. randomly. After photography, we were preserved them in 70% alcohol for further identification in lab. Spider identification were done by various books, research paper viz. “Spider Genera of India”, “Spider of India”, “Handbook of Indian Spider” etc.

Opportunistic sampling and field photography were carried out for butterfly and odonates sampling. In case any critical condition, specimens where photo collection were impossible, collected only with handheld aerial sweep nets and subsequently released without harm. The butterflies were identified using identification keys and photographic catalogue published by Moore (1850-1905), Talbot (1939, 1947), Evans (1932), Antram (1924), Haribal (1992), Kehimkar (2008), Wynter-Blyth (1957) and several other published research paper. For Odonate's, systematic arrangement and scientific name were followed Subramanian & Babu (2017).

For moth sampling, light source of 200 watt lamp was used with white cloth background in night. A white cloth of 10 × 6 ft. was hung between two vertical poles with lamp at the centre. The light trap was operated from 19:00 to 23:00. The moths were identified based on the digital photographs with the help of available literature (Hampson 1892; 1894; 1895; 1896; Bell, Scott 1937; Holloway 1987; 1999; 2005; Schintlmeister, Pinratana 2007; Kononenko, Pinratana 2013). Few moth were identified with some of the web resources consulted for the purpose of identification viz. www.jpmoths.org; www.mothsofindia.org/ and <https://www.flickr.com/groups/mothsofindia/>. The higher level classification of Order Lepidoptera by van Nieukerken *et al.* (2011) was followed for the present work.

For mantis sampling, we were used sweep net for free flying mantids and spotting observation was done by collection and photography. For identification we used keys of state fauna services of Zoological Survey of India, Kolkata.

For crab sampling, we were explore along the beach and marshy area and wandering crabs were captured by hand whereas burrowing crabs were collected through the effective use of the iron sticks which are used by the crab catchers. Specimens were identified using the keys and portal website (www.species-identification.org) (Guerao and Rotllant 2009; Jeyabaskaran and Wafar 2002). The taxonomic status of crabs was adopted from World Register of Marine Species (WoRMS 2016).

Result:-

All the selected invertebrates fauna in the present study showed a greater diversity where in highest species richness was observed in the group of spider, followed by butterfly, odonates, moth, crab and mantis. The present study was reported 114 species of spiders under 20 family; 102 species of butterfly under 5 family; 43 species of odonates under 5 family; 35 species of moth under 9 family; 9 species of mantis under 3 family and 18 species of crab (Decapods and Xiphosura) under 6 family.

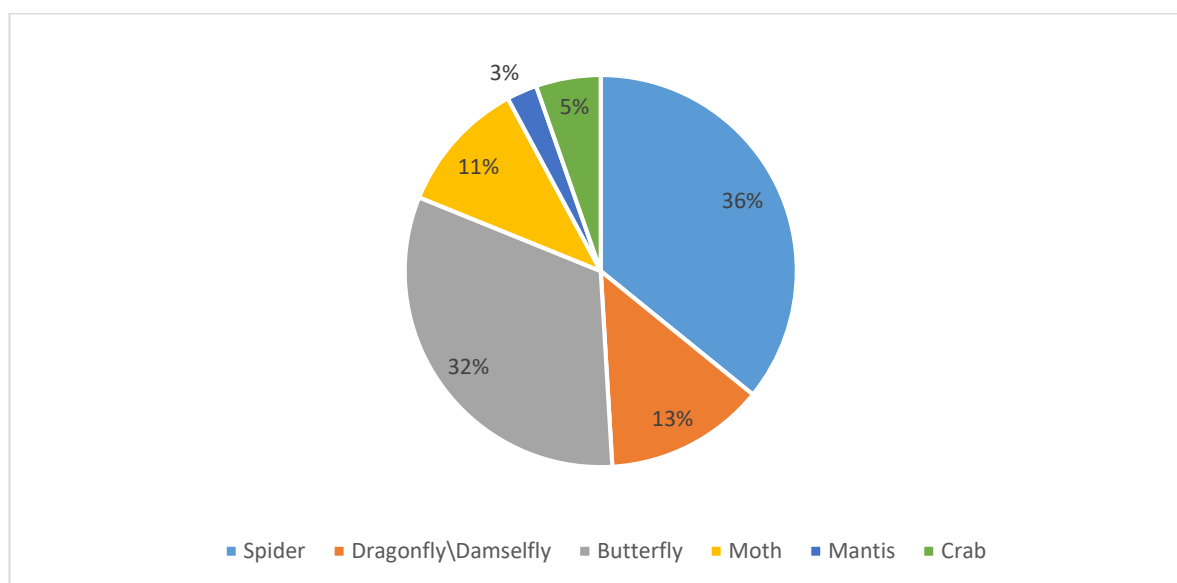


Fig - 2:- Percentage of different group of invertebrates from the study area.

Table – A. A checklist of the different arthropods fauna from the study area. (**New records from Purba Medinipur)

Phylum\Subphylum\Class\Family	Species
Phylum - Arthropoda	
Subphylum - Chelicerata	
Class – Arachnida	
Infraorder – Megalomorphae	
Family - Idiopidae Simon,1889 (Armoured trapdoor Spider)	
	<i>Heligmomerus</i> sp.
Infraorder – Araneomorphae	
Family - Araneidae Clerck, 1757 (Orb web or tent web spiders)	
	<i>Anepsion</i> sp.
	<i>Arachnura</i> sp.
	<i>Araneus mitificus</i> (Simon,1886)
	<i>Argiope catenulata</i> (Doleschall,1859)
	<i>Argiope aemula</i> (Walckenaer, 1841)
	<i>Argiope</i> sp.
	<i>Cyclosa hexatuberculata</i> (Tikader,1881)
	<i>Cyclosa bifida</i> (Doleschall,1859)
	<i>Cyrtarachne ixoides</i> (Simon,1870)
	<i>Cyrtophora cicatrosa</i> Stoliczka,1869
	<i>Eriovixia excelsa</i> (Simon,1889)
	<i>Eriovixia laglaizei</i> (Simon,1877)
	<i>Gasteracantha hasselti</i> (C.L.Koch ,1837)
	<i>Gasteracantha kuhli</i> (C.L.Kuch,1837)
	<i>Gea</i> sp.
	<i>Larinia</i> sp.
	<i>Neoscona muckerji</i> (Tikader,1980)
	<i>Neoscona subfusca</i> (C.L.Kuch , 1837)
	<i>Neoscona theisi</i> (Walckenaer, 1841)
	<i>Neoscona vigilans</i> (Blackwall, 1865)
	<i>Nephila pilipes</i> (Fabricius ,1793)
	<i>Pasilobus</i> sp.
	<i>Parawixia dehaani</i> (Doleschall,1859)
	<i>Polys</i> sp.
Family - Cheiracanthiidae Wagner, 1887 (Sac or tube spiders)	
	<i>Cheiracanthium</i> sp.
Family - Clubionidae Wagner, 1887 (Sac or tube spiders)	

	<i>Clubiona</i> sp.
Family -Corinnidae Karsch, 1880 (Antmimic spiders)	
	<i>Castianeira</i> sp.
	<i>Cambalida</i> sp.
	<i>Corinnomma</i> sp.
Family -Dictynidae O. Pickard-Cambridge, 1871 (Mesh web spiders)	
	<i>Ajmonia</i> sp.
Family -Eresidae C. L. Koch, 1845 (Velvet spiders)	
	<i>Stegodyphus</i> sp.
Family -Gnaphosidae Pocock, 1898 (Ground spiders)	
	<i>Poecilochroa</i> sp.
	<i>Zelotes</i> sp.
Family -Hersiliidae Thorell, 1870 (Two-tailed spiders)	
	<i>Hersilia savignyi</i> (Lucas, 1836)
Family -Lycosidae Sundevall, 1833 (Wolf spiders)	
	<i>Arctosa</i> sp.
	<i>Lycosa</i> sp.
	<i>Hippasa</i> sp.
	<i>Pardosa</i> sp.
Family -Oxyopidae Thorell, 1870 (Lynx spiders)	
	<i>Hamadruas</i> sp.
	<i>Hamataliwa</i> sp.
	<i>Oxyopes sunandae</i> (Tikader, 1970)
	<i>Oxyopes shweta</i> (Tikader, 1970)
	<i>Peucetia viridana</i> (Stoliczka, 1869)
Family -Pholcidae C.L. Koch, 1850 (Cellar spiders)	
	<i>Artema</i> sp.
	<i>Crossopriza lyoni</i> (Blackwall, 1867)
	<i>Pholcus</i> sp.
	<i>Smeringopus</i> sp.
Family - Pisauridae Simon, 1890 (Nursery web spiders)	
	<i>Eucamptopus</i> sp.
	<i>Hygropoda</i> sp.
Family - Salticidae Blackwall, 1841 (Jumping spiders)	
	<i>Asemonia</i> cf. <i>tenuipes</i>
	<i>Bianor</i> sp.
	<i>Brancus</i> sp.
	<i>Brettus cingulatus</i> (Thorell, 1859)
	<i>Carrhotus viduus</i> (C.L. Koch, 1846)
	<i>Chrysilla volupi</i> (Thorell, 1887)
	<i>Cyrba</i> sp.
	<i>Epocilla</i> sp.
	<i>Harmochirus</i> sp.
	<i>Hasarius adansoni</i> (Adounin, 1826)
	<i>Hyllus semicupreus</i> (Simon, 1885)
	<i>Indopadilla</i> sp.
	<i>Langona</i> sp.
	<i>Madhyattus</i> sp.
	<i>Marengo</i> sp.
	<i>Menemerus bivitatus</i> (Dufour, 1831)
	<i>Menemerus fulvus</i> (L. Koch, 1878)
	<i>Myrmaplata plataleoides</i> (O. Pickard-Cambridge, 1869)

	<i>Myrmarachne melanocephala</i> (MacLeay, 1839)
	<i>Phaeacius</i> sp.
	<i>Phintella vittata</i> (C.L.Koch,1846)
	<i>Phintelloides</i> sp.
	<i>Plexippus paykulli</i> (Audouin,1826)
	<i>Plexippus petersi</i> (Karsch, 1878)
	<i>Portia</i> sp.
	<i>Rhene danieli</i> (Tikader, 1973)
	<i>Rhene rubigera</i> (Thorell, 1887)
	<i>Siler semiglaucus</i> (Simon, 1901)
	<i>Stenaelurillus</i> sp.
	<i>Telamonia dimidiata</i> (Simon,1899)
	<i>Thiania bhamoensis</i> (Thorell, 1887)
	<i>Thyene imperialis</i> (Rossi, 1846)
Family -Scytodidae Blackwall, 1864 (Spitng spiders)	
	<i>Scytodes pallida</i> (Doleschall, 1859)
Family -Sparassidae Bertkau, 1872 (Giant crab spiders)	
	<i>Heteropoda venatoria</i> (Linnaeus, 1767)
	<i>Olios lamarcki</i> (Latreille, 1806)
	<i>Olios milleti</i> (Pocock,1901)
Family -Tetragnathidae Menge, 1866 (Long jawed spiders)	
	<i>Guizygiella</i> sp.
	<i>Leucage decorata</i> (Blackwall,1864)
	<i>Tetragnatha ceylonica</i> (O. Pickard-Cambridge, 1869)
	<i>Tetragnatha javana</i> (Thorell, 1890)
	<i>Tetragnatha</i> sp.
	<i>Tylorida</i> sp.
Family -Theridiidae Sundevall, 1833 (Comb-footed spiders)	
	<i>Argyroides flavescences</i> (O. P. -Cambridge, 1880)
	<i>Argyroides</i> sp.
	<i>Ariannes</i> sp.
	<i>Meotipa</i> sp.
	<i>Nesticodes</i> sp.
	<i>Parasteatoda</i> sp.
	<i>Platnickina</i> sp.
	<i>Thwaitesia</i> sp.
	<i>Romphaea</i> sp.
Family -Thomisidae Sundevall, 1833 (Crab spiders)	
	<i>Amyciaea</i> sp.
	<i>Camaricus</i> sp.
	<i>Indoxysticus</i> sp.
	<i>Oxytate</i> sp.
	<i>Runcinia</i> sp.
	<i>Synema</i> sp.
	<i>Thomisus lobosus</i> (Tikader, 1965)
	<i>Thomisus</i> sp.
	<i>Tmarus</i> sp.
Family -Uloboridae Thorell, 1869 (Feather-legged lace weavers)	
	<i>Uloborus</i> sp.(1)
	<i>Uloborus</i> sp.(2)
	<i>Zosis geniculata</i> (Olivier, 1789).
Family -Zodariidae Thorell, 1881 (Ant spiders)	

	<i>Asceua</i> sp.
	<i>Mallinella</i> sp.
Class - Insecta	
Order - Odonata	
Suborder - Anisoptera	
Family – Aeshnidae	
	<i>Anaciaeschna jaspidea</i> (Burmeister, 1839)
	<i>Anax guttatus</i> (Drury, 1773)
	<i>Gynacantha dravida</i> Lieftinck, 1960
Family – Gomphidae	
	<i>Ictinogomphus rapax</i> (Rambur,1842)
	<i>Paragomphus lineatus</i> (Selys,1850)**
Family – Libellulidae	
	<i>Acisoma panorpoides</i> (Rambur,1842)
	<i>Brachythemis contaminata</i> (Fabricius,1793)
	<i>Aethriamanta brevipennis</i> (Ramber, 1842)
	<i>Brachydiplax chalybea</i> (Brauer, 1868)
	<i>Brachydiplax farinosa</i> (Krüger, 1902)
	<i>Brachydiplax sobrina</i> (Rambur, 1842)
	<i>Bradinyopyga geminata</i> (Rambur, 1842)
	<i>Crocothemis servilia</i> (Drury, 1773)
	<i>Diplacodes trivialis</i> (Rambur ,1842)
	<i>Diplacodes nebulosa</i> (Fabricius, 1793)
	<i>Macrodiplax cora</i> (Brauer,1867)
	<i>Lathrecista asiatica</i> (Fabricius, 1798)
	<i>Neurothemis fulvia</i> (Drury,1773)
	<i>Neurothemis intermedia</i> (Rambur ,1842)
	<i>Neurothemis tullia</i> (Drury, 1773)
	<i>Orthetrum pruinosum</i> (Burmeister,1839)
	<i>Orthetrum sabina</i> (Drury,1770)
	<i>Pantala flavescens</i> (Fabricious,1798)
	<i>Potamarcha congener</i> (Rambur,1842)
	<i>Rhodothemis rufa</i> (Rambur, 1842)
	<i>Rhyothemis variegata</i> (Linnaeus,1763)
	<i>Tholymis tillarga</i> (Fabricius,1798)
	<i>Tamea basilaris</i> (Palisot de Beauvois, (1817)
	<i>Tamea limbata</i> (Desjardins,1832)
	<i>Trithemis pallidinervis</i> (Kirby, 1889)
	<i>Urothemis signata</i> (Rambur, 1842)
	<i>Zyxomma petiolatum</i> Rambur, 1842
Suborder – Zygoptera	
Family – Coenagrionidae	
	<i>Agriocnemis lacteola</i> (Selys, 1877)
	<i>Agriocnemis pygmaea</i> (Rambur,1842)
	<i>Agriocnemis kalinga</i> (Nair & Subramanian 2015)
	<i>Ceriagrion cerinorubellum</i> (Brauer,1865)
	<i>Ceriagrion coromandelianum</i> (Fabricius,1798)
	<i>Ischnura aurora</i> (Brauer,1865)
	<i>Ischnura senegalensis</i> (Rambur,1842)
	<i>Onychargia atrocyana</i> (Selys, 1865)

	<i>Pseudagrion rubriceps</i> (Selys, 1876)
Family – Platycnemididae	
	<i>Copera marginipes</i> (Rambur, 1842)
	<i>Copera ciliata</i> (Selys, 1863)
Order - Lepidoptera Suborder - Rhopalocera Family- Hesperidae	
	<i>Hasora badra</i> (Moore, 1857)**
	<i>Hasora chromus</i> (Cramer, 1780)
	<i>Badamia exclamationis</i> (Fabricius, 1775)
	<i>Tagiades japedus</i> (Stoll, 1781)
	<i>Spialia galba</i> (Fabricius, 1793)
	<i>Lambrix salsala</i> (Moore, 1865)
	<i>Udaspes folus</i> (Cramer, 1775)
	<i>Suastus gremius</i> (Fabricius, 1798)
	<i>Hyarotis adrastus</i> (Stoll, 1782)
	<i>Gangara thyrsis</i> (Fabricius, 1775)
	<i>Erionota thrax</i> (Linnaeus, 1767)
	<i>Matapa aria</i> (Moore, 1865)
	<i>Taractrocera maevius</i> (Fabricius, 1793)
	<i>Telicota colon</i> (Fabricius, 1775)
	<i>Telicota bambusae</i> (Moore, 1878)
	<i>Parnara guttata</i> (Bremer & Grey, 1852)
	<i>Parnara ganga</i> (Evans, 1937)
	<i>Borbo bevani</i> (Moore, 1878)
	<i>Borbo cinara</i> (Wallace, 1866)
	<i>Pelopidus agna</i> (Moore, 1865)
	<i>Pelopidus mathias</i> (Fabricius, 1798)
Family-Papilionidae	
	<i>Grraphium doson</i> (C. & R. felder, 1984)
	<i>Graphium agamemnon</i> (Linnaeus, 1758)
	<i>Papilio polymnestor</i> (Cramer, 1775)
	<i>Papilio crino</i> (Fabricius, 1793)
	<i>Papilio polytes</i> (Linnaeus, 1758)
	<i>Papilio demoleus</i> (Linnaeus, 1758)
	<i>Papilio clytia</i> (Linnaeus, 1758)
	<i>Atrophaneura hector</i> (Linnaeus, 1758)
	<i>Atrophaneura aristolochiae</i> (Fabricius, 1775)
Family – Pieridae	
	<i>Belenois aurota</i> (Fabricius, 1793)
	<i>Cepora nerissa</i> (Fabricius, 1775)
	<i>Delias eucharis</i> (Drury, 1773)
	<i>Appias libythea</i> (Fabricius, 1775)
	<i>Leptosia nina</i> (Fabricius, 1793)
	<i>Ixias pyrene</i> (Linnaeus, 1764)
	<i>Colotis amata</i> (Fabricius, 1775)
	<i>Pareronia hippia</i> (Fabricius, 1787)
	<i>Catopsilia pomona</i> (Fabricius, 1775)
	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)
	<i>Eurema brigitta</i> (Stoll, 1780)
	<i>Eurema hecabe</i> (Linnaeus, 1758)
	<i>Eurema blanda</i> (Boisduval, 1836)
Family – Lycaenidae	

	<i>Spalgis epeus</i> (Westwood, 1851)
	<i>Curetis thetis</i> (Drury, 1773)
	<i>Jamides celeno</i> (Cramer, 1775)
	<i>Catochrysops strabo</i> (Fabricius, 1793)
	<i>Lampides boeticus</i> (Linnaeus, 1767)
	<i>Leptotes plinius</i> (Fabricius, 1793)
	<i>Castalius rosimon</i> (Fabricius, 1775)
	<i>Tarucus nara</i> (Kollar, 1848)
	<i>Zizeeria karsandra</i> (Moore, 1865)
	<i>Zizeeria maha</i> (Kollar, 1844)
	<i>Zizina otis</i> (Fabricius, 1787)
	<i>Zizula hylax</i> (Fabricius, 1775)
	<i>Neopithecops zalmora</i> (Butler, 1870)
	<i>Euchrysops cnejus</i> (Fabricius, 1798)
	<i>Chilades lajus</i> (Stoll, 1780)
	<i>Chilades pandava</i> (Horsfield, 1829)
	<i>Anthene emolus</i> (Godart, 1823)
	<i>Anthene lycaenina</i> (Felder, 1868)
	<i>Spindasis vulcanus</i> (Fabricius, 1775)
	<i>Spindasis ictis</i> (Hewitson, 1865)
	<i>Spindasis lohita</i> (Horsfield, 1829)
	<i>Mahathala ameria</i> (Hewitson, 1862)
	<i>Iraota timoleon</i> (Stoll, 1790)
	<i>Creon cleobis</i> (Godart, 1824)
	<i>Virachola isocrates</i> (Fabricius, 1793)
	<i>Rapala manea</i> (Hewitson, 1863)
	<i>Amblypodia anita</i> (Hewitson, 1862 **)
Family Nymphalidae	
	<i>Parantica aglea</i> (Stoll, 1782)
	<i>Tirumala limniace</i> (Cramer, 1775)
	<i>Danaus genutia</i> (Cramer 1779)
	<i>Danaus melanippus</i> (Cramer, 1777)
	<i>Danaus chrysippus</i> (Linnaeus, 1758)
	<i>Euploea klugii</i> (Moore, 1857)
	<i>Euploea core</i> (Cramer, 1780)
	<i>Melanitis leda</i> (Linnaeus, 1758)
	<i>Elymnias hypermnestra</i> (Linnaeus, 1763)
	<i>Lethe europa</i> (Fabricius, 1775)
	<i>Mycalesis perseus</i> (Fabricius, 1775)
	<i>Mycalesis mineus</i> (Linnaeus, 1758)
	<i>Ypthima huebneri</i> (Kirby, 1871)
	<i>Ypthima baldus</i> (Fabricius, 1775)
	<i>Discophora sondaica</i> (Boisduval, 1836)
	<i>Ariadne ariadne</i> (Linnaeus, 1763)
	<i>Ariadne merione</i> (Cramer, 1777)
	<i>Phalanta phalantha</i> (Drury, 1773)
	<i>Vanessa cardui</i> (Linnaeus, 1758)
	<i>Junonia hierta</i> (Fabricius, 1798)
	<i>Junonia orithya</i> (Linnaeus, 1758)
	<i>Junonia lemonias</i> (Linnaeus, 1758)
	<i>Junonia almana</i> (Linnaeus, 1758)
	<i>Junonia atlites</i> (Linnaeus, 1763)
	<i>Junonia iphita</i> (Cramer, 1779)
	<i>Hypolimnas misippus</i> (Linnaeus, 1764)
	<i>Hypolimnas bolina</i> (Linnaeus, 1758)

	<i>Neptis hylas</i> (Linnaeus, 1758)
	<i>Neptis jumbah</i> (Moore, 1857)
	<i>Moduza procris</i> (Cramer, 1777)
	<i>Euthalia aconthea</i> (Cramer, 1777)
	<i>Acraea violae</i> (Fabricius, 1775)
Suborder - Heterocera	
Family – Bombycidae	
	<i>Trilocho varians</i> (Walker, 1855)
Family - Crambidae	
	<i>Diaphania indica</i> (Saunders, 1851)
	<i>Cnaphalocrocis medinalis</i> (Guenee, 1854)
	<i>Leucinodes orbonalis</i> (Guenee, 1854)
	<i>Maruca vitrata</i> (Fabricius, 1787)
	<i>Parotis</i> sp.
	<i>Scripophaga incertulas</i> (Walker, 1863)
Family –Erebidae	
	<i>Amata passalis</i> (Fabricius, 1781)
	<i>Amata cyssea</i> (Stoll, 1782)
	<i>Cretonotos transiens</i> (Walker, 1855)
	<i>Eressa confinis</i> (Walker, 1854)
	<i>Grammodes fucboicus</i> (Fabricius, 1787)
	<i>Olepa ricini</i> (Fabricius, 1775)
	<i>Oraesia</i> sp.
	<i>Syntomoides imaon</i> (Cramer, 1780)
	<i>Mocis frugalis</i> (Fabricius, 1775)
	<i>Eudocima maternal</i> (Linnaeus, 1767)
	<i>Rhesala moestalis</i> (Walker, 1866)
	<i>Achaea janata</i> (Linnaeus, 1758)
	<i>Hypopyra vespertilio</i> (Fabricius, 1787)
	<i>Spirama</i> sp.
	<i>Eutetheisa pulchelloides</i> (Hampson, 1907)
Family – Limacodidae	
	<i>Parasa Lepida</i> (Cramer, 1799)
Family – Geometridae	
	<i>Cleora</i> sp.
	<i>Eumelea rosalia</i> (Stoll, 1781)
	<i>Hyperythra lutea</i> (Stoll, 1781)
	<i>Hemithea</i> sp.
Family – Noctuidae	
	<i>Chalciope mygdon</i> (Cramer, 1777)
	<i>Leucania</i> sp.
	<i>Spodoptera litura</i> (Fabricius, 1775)
Family – Pyralidae	
	<i>Endotricha mesenterialis</i> (Walker, 1859)
Family – Sphingidae	
	<i>Agrius convolvuli</i> (Linnaeuss, 1758)
	<i>Daphnis nerii</i> (Linnaeus, 1758)
	<i>Theretra clotho</i> (Drury, 1773)
Family – Thyrididae	
	<i>Striglina scitaria</i> (Walker, 1862)
Order – Mantodea	
Family – Hymenopodidae	
	<i>Creobroter apicalis</i> (Saussure, 1869)

	<i>Odontomantis</i> (Saussure, 1871)
Family – Liturgusidae	
	<i>Humbertiella ceylonica</i> (Saussure, 1869)
	<i>Humbertiella similis</i> (Giglio-Toss, 1917)
Family – Mantidae	
	<i>Hierodula patelifera</i> (Serville, 1839)
	<i>Hierodula tenuidentata</i> (Saussure, 1869)
	<i>Mantis religiosa</i> (Linnaeus, 1758)
	<i>Statilla apicalis</i> (Saussure, 1871)
	<i>Statilla maculata</i> (Thunberg, 1784)
Subphylum - Crustacea Class - Malacostraca Order - Decapoda Infra order - Anomura Family – Diogenidae	
	<i>Diogenes</i> sp.
	<i>Clibanaris padavensis</i> (De Man, 1888)
	<i>Scylla serrata</i> (Forsskal, 1775)
Infraorder - Brachyura Family – Ocypodidae	
	<i>Ocypoda macrocera</i> (H. Milne Edwards, 1837)
	<i>Ocypoda pallidulaz</i> (Hombron & Jacquinot, 1846)
	<i>Uca (Paraleptuca) crassipes</i> (White, 1847)
	<i>Uca (Gelasimus) tetragonon</i> (Herbst, 1790)
	<i>Uca (Tubuca) typhoni</i> (Crane, 1975)
	<i>Uca (Austruca) perplexa</i> (H. Milne Edwards, 1837)
	<i>Uca (Gelasimus) vocans</i> (Linnaeus, 1758)
	<i>Uca (Austruca) triangularis</i> (A. Milne-Edwards, 1873)
	<i>Uca (Tubuca) rosea</i> (Tweedie, 1937)
	<i>Ocypode ceratophthalmus</i> (Pallas, 1772)
Family – Macrophthalmidae	
	<i>Macrophthalmus</i> (<i>Macrophthalmus</i>) <i>sulcatus</i> (H. Milne Edwards, 1852)
Family – Grapsidae	
	<i>Pachygrapsus crassipes</i> (Randall, 1840)
Family – Matutidae	
	<i>Matuta victor</i> (Fabricius, 1781)
Subphylum - Chelicera Order - Xiphosura Family – Limulidae	
	<i>Tachypleus gigas</i> (O. F. Müller, 1785)
	<i>Carcinoscorpius rotundicauda</i> (Latreille, 1802)

Among spider, highest number of species recorded in salticidae family (n=32), followed by araneidae (n=24), theridiidae (n=9), thomisidae family (n=9), tetragnathiidae (n=6), oxyopidae (n=5), lycoenidae (n=4), pholcidae (n=4), corinnidae (n=3), sparassidae (n=3), uloboridae (n=3), Gnaphosidae (n=2), pisauridae (n=2), zodaridae (n=2), cheiracanthiidae (n=1), clubionidae (n=1), dictynidae (n=1), eresidae (n=1), hersiliidae (n=1), scytodidae (n=1). Among butterfly, dominant number of species was seen in nymphaliidae family (n=32), followed by lycaenidae (n=27), hasperidae (n=21), pieridae (n=13), papilionidae (n=9). Among odonates,

libelulidae family (n=27) was recorded highest species richness, followed by coenagrionidae (n=9), aeshnidae (n=3), gomphidae (n=2), platycnemidae (n=2). Among moth, erebidae (n=15) family was showed greater species richness, followed by crambidae (n=6), geomatrodae (n=4), nocturnidae (n=3), spingidae (n=3), bombycidae (n=1), limacodidae (n=1), pyralidae (n=1) and thyrioridae (n=1). Among mantis, family montidae (n=5) was recorded highest species richness, followed by liturgustidae (n=2) and hymnropodidae (n=1). Within crab (decapods and xiphosours) family ocypodidae (n=10) was recorded highest species richness, followed by diagenidae (n=3), limulidae (n=2), macrophthalmidae (n=1), grapsidae (n=1) and maturtidae (n=1).

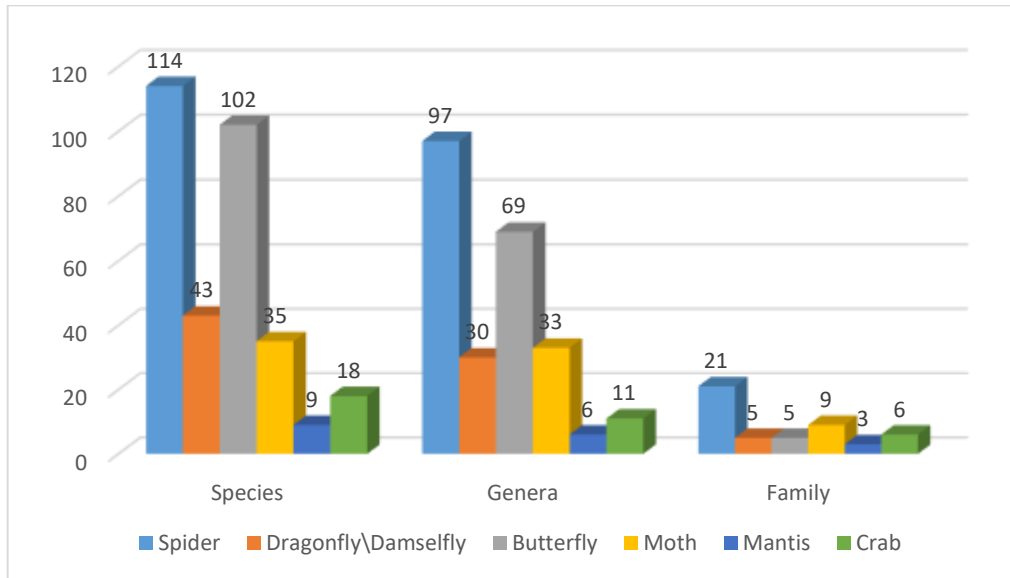


Fig-(3):- Family, species and genera of invertebrates group from the study area.

In this study, two butterfly, *Hasora badra* under hesperiidae family and *Amblypodia anita* under lycaenidae family and one odonates, *Paragomphus lineatus* under Gomphidae family recorded first time from Purba Medinipur district.

Hasora badra :- It is dark brown on the upper surface and devoid of marking in the male. The forewings of the female however have 3 large yellowish hyaline spots in the median area, and 3 small pale spots on the subapical area. On the underside both sexes are dark, with a purplish sheen and a small white spot on the discal cell.(Learn About Butterflies, 2022).

Amblypodia anita :- Looks like a dry leaf. A lobe and tail present on hindwing. Male under grey with bluish gloss. Upper side purplish blue with narrow black border on both wings. Female brown on under. Upper side brown with narrow purplish basal and central area. A dark discal line present on both wings in both sexes.(Boruah *et. al.*, 2018).

Paragomphus lineatus:- Male is Medium-sized yellow and black dragonfly identified by the lateral expansions of 8th and 9th abdominal segments and diagnostic hook-shaped superior anal appendages. Female is similar to male but duller in colour lacking lateral expansions to abdomen and the hooked tip. It is commonly found near Lakes, reservoir-edges, ponds and river sides.(Nair, 2011).

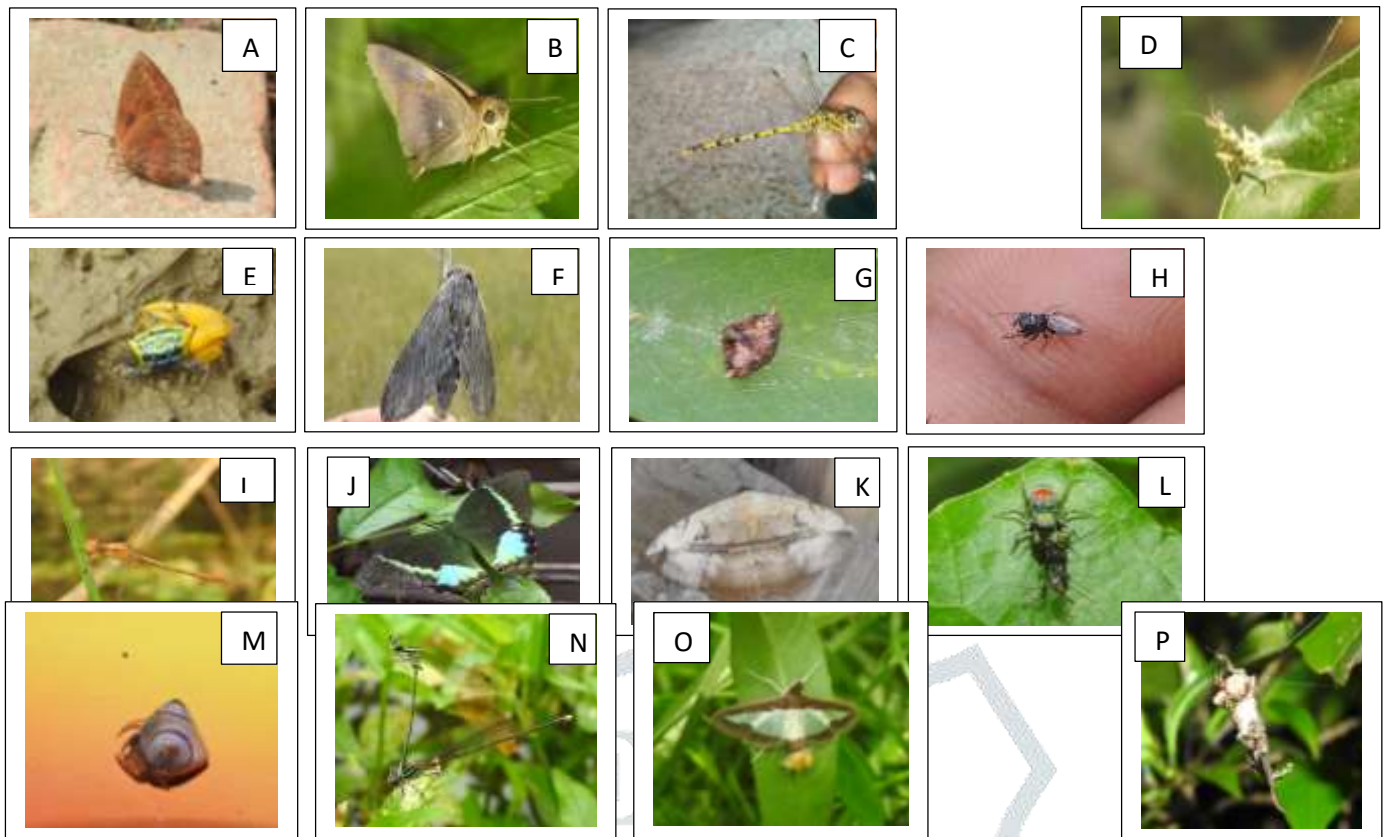


Fig-4:- A- *Amblypodia anita* B- *Hasora badra* C- *Paragomphus lineatus* D- *Creobroter apicalis* E- *Uca (Austruca) triangularis* F- *Agrius convolvuli* G- *Pasilobus* sp. H- *Madhyattus* sp I- *Neurothemis intermedia* J- *Papilio crino* K- *Hypopyra vespertilio* L- *Siler semiglaucus* M- *Cyrtarachne* sp. N- *Pseudocopera ciliate* O- *Diaphania indica* P- *Hamataliwa* sp.

(Photos: fig-1 A to I & K to P- Piklu Das; J – Sandhyarani Bindhyani)

Discussion :-

The present study was carried out in 545 acres area and 9.62 km in length. In this small area, very rich diversity of arthropods is found because of mix habitat, like estuary, mangroves, agricultural land, aquaculture pond and fresh water wetland and it is transitional zone of aquatic and terrestrial ecosystem. Whereas 114 species of spiders under 20 family; 102 species of butterfly under 5 family; 43 species of odonates under 5 family; 35 species of moth under 9 family; 9 species of mantis under 3 family and 18 species of crab (Decapods and Xiphosura) under 6 family is recorded. From this study two butterfly, *Hasora badra* under hesperiidae family and *Amblypodia anita* under lycanidae family and one odonates, *Paragomphus lineatus* under Gomphidae family recorded first time from Purba Medinipur district.

Hasora badra species of butterfly was very abundantly observed during dawn and dusk in winter season and one species was observed during rainy season. Habitat is covered by *Lantana camera* and *Clerodendrum* bush of a nearby freshwater pond. It is very commonly recorded from North Bengal, but there is no sighting records from South Bengal. So, It's may be recorded officially first time from South Bengal.

Amblypodia anita species of butterfly was found twice in this study period in rainy season.

Paragomphus lineatus species of odonate was observed once in night sitting beside a lamp light where moth collection sampling was occurred.

Pasilobus sp, *Hamadruas* sp, *Brancus* sp, *Madhyattus* sp, *Thiania bhamoensis*, *Amyciaea* sp among spider; *Paragomphus lineatus*, *Anaciaeschna jaspidea*, *Bradinopyga geminata*, *Neurothemis intermedia* among odonates; *Spialia galba*, *Gangara thyraxis*, *Borbo cinara*, *Iraota timoleon*, *Creon cleobis*, *Parantica aglea*, *Junonia hierta* among butterfly; *Agrius convolvuli* among moth; *Creobroter apicalis* among mantis; *Uca (Tubuca) rosea* among crab was observed only once during the study.

Biodiversity of coastal zones and their hydrologically linked coastal areas have come under tremendous environmental pressures during recent decades (Mukherjee and Bakshi 1998). Various human development projects, habitat destruction, increasing population, pollution, tourists pressure, land encroachment by fisherman, land shifting from agricultural land to fisheries, deforestation are increasing day by day in this area, still high number of species richness are there. So, we have to conserve and protect this habitat as well as wildlife so proper steps need be taken along with various awareness camps, workshop program with the local community.

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