2. Review of literature:

The literature about the aquatic and marshy land plants is less than the terrestrial communities. Arber (1920) in her book "*Water plants: A study of aquatic angiosperms"* survey the older morphological, anatomical literature, and the book is indispensable even to modern students. Sculthorpe (1967) in the "*Biology of aquatic vascular plants*" has summarized more recent literature relating to the ecology and biology of water plants. Similarly, Cook et al. (1974) have done a taxonomic overview of freshwater aquatic plants in his book *"Water plants of the world"*.

The first most acceptable work has been done by Agharkar (1923) of Indian aquatic and wetland macrophytes. The first acceptable book *"Handbook of common water and marsh plant of India and Barma"* had been published by Biswas and Calder (1937). Then Subramanyam (1962) published *"Aquatic Angiosperms: A Systematic Account of Common Indian Aquatic Angiosperms"*(Volume-1), for the first time he provided the key for the identification of aquatic flowering plants with some excellent illustrations and later Deb (1976) published an enumeration of aquatic vascular plants of India. Later Lavania *et al.* (1990) documented a short volume on *"Aquatic vegetation of Indian Subcontinent"*.

The ecofloristic survey of aquatic and marshy land plant life in India is moderately well acknowledged through many publications by Gupta (1965), Koul and Zutshi (1967), Manilal and Sivarajan (1978), Sahai and Sinha (1968), Koushik (1969), Karthikeyan et al. (1982), Gopal (1990). The number of new species has been added by Bruggen (1968), Raghvan et al. (1982), Joseph and Sivarajan (1988), Joseph and Sivarajan (1990), Joseph (1991), Yadav and Govekar (1994), etc. Cook (1996) in his book '*Aquatic and wetland plants of India*' has documented about 485 species of aquatic and semi-aquatic (wetland) flowering plants with keys for identification, descriptions, and illustrations. He has also revised genera viz. *Rotala*

(1979), *Nechamandra* (1982b), *Blyxa* (1983), and *Ottelia* (1984). Joseph and Sivarajan (1993) have revised genus *Nymphoides* for India. Gopal (1973), WWF India (1993), Williams (1997), and IUCN (1971) revised the management of wetlands and their macrophytic flora in India. Pattanaik (1956), Kachroo's (1984) studies on aquatic and wetland plants of India are well documented.

A preliminary survey of the hydrophytes of Nagpur has been done by Mirashi (1954, 1957 and 1958). Patnaik and Patnaik (1956) studied on the hydrophytes of Cuttack. Puri and Mahajan (1958) studied the vegetation of marshes and swamps in the Poona District. Kachroo (1959) had done work on Aquatic vegetation of the Damodar Valley and Phanerogamic flora of freshwater ponds and marshy lands with particular reference to Eden Canal areas of West Bengal. Sen and Chatterjee (1959) studied on aquatic and swampy vegetation of Gorakhpur. Maheshwari (1960) studied the origin and distribution of the naturalized plants of Khandwa Plateau, Madhya Pradesh. Chavan and Sabnis (1961) studied on hydrophytes of Boroda. Seerwani (1962) studied in the hydrophytes and plants of low lying habitats in Jabalpur. Subramanyam (1962) systematic studied the Common Indian Aquatic Angiosperms. Satyanarayan (1963) works on the hydrophytic vegetation of Jalukbari. Vyas (1964) studied in hydrophytes and marsh plants of Alwar and environs. Majumdar (1965) studied on aquatic and semi-aquatic flora of Calcutta and adjacent localities. Unni (1967) studied the vegetation of ponds, swamps, and river banks in Raipur, Madhya Pradesh. Bhaskar and Raji (1973) worked on hydrophytes and marsh plants in Mysore city. Patnaik (1977) studied the aquatic plants of Chilka Lake. Billore and Vyas (1981) worked on the distribution and production of macrophytes in Pichhola Lake, Udaipur. Deb (1981 and 1983) documented the Flora of Tripura State, Vol-I, and II. Mukhopadhyay (1987) studied in Aquatic and Semi-aquatic plants of Birbhum District, West Bengal. Dey and Kar (1989) studied on Aquatic macrophytes of Lake Son in Assam. Islam (1989-1990) studied on Aquatic weeds of North -

East India and the aquatic and marshland flora of Assam. Dan and Mandal (1990) studied the aquatic plants of Durgapur Industrial Belt West Bengal regarding the water environment.

Majumder *et al.* (1990) studied the observations on the wetland ecosystem of Kawar Lake in Begusarai, Bihar with special reference to vegetation. Naskar (1990) published Aquatic and semi-aquatic plants of the lower Ganga Delta. Chattopadhyay and Mukherjee (1996) studied the aquatic plant diversity of Hooghly district, West Bengal. Das *et al* (1996) worked on Traditional uses of wetland plants of Eastern Orissa. Mondal *et al* (1998) documented aquatic angiosperms of Purulia district, West Bengal. Roy and Banerjee (1998) observed preliminary on the plant diversity of the lake Rabindra Sarobar, Calcutta, India. Bhattacharya and Palit (2000) enumerated of hydrophytes in Burdwan University Campus. Kar and Barbhuiya (2001) investigated the ecology of aquatic macrophytes of Chatla Haor, a floodplain wetland in the Cachar district of Assam. Dutta *et al*. (2002) worked on aquatic macrophytes of Apalchand reserve in the Jalpaiguri district of West Bengal. Panda *et al.* (2002) made a checklist of the flora of Chilka Lake and its immediate neighborhood. Chakraborty and Hazra (2003) studied aquatic monocot of West Bengal family Hydrocharitaceae, Pontederiaceae, Xyridaceae, and Alismataceae.

Mandal *et al.* (2003) preliminary surveyed of wetland plants in Purulia district, West Bengal. Madhvachetty *et al.* (2004) worked on hydrophytes of Chittor district in Andhra Pradesh, India. Pradhan *et al.* (2005) studied the diversity of freshwater macrophytic vegetation of six rivers of South West Bengal. Barooah and Mahanta (2006) studied aquatic angiosperms of Biswanath Chariali, Assam. Narain and Mishra (2008) documented a list of aquatic and marshy plants of the Bundelkhand region of Uttar Pradesh. Sharma and Joshi (2008) comparative studied freshwater swamps of Doon Valley. Bhowmik *et al.* (2008) recorded of aquatic and marshland plants in West Tripura, India. Beeteswari Kh. *et al*. (2009) documented

on floristic distribution and growth form analysis of macrophytes in Knogba River, Manipur, India.

Meitei *et al*. (2010) studied life form analysis of aquatic macrophytes in community ponds of Imphal Valley, Manipur. Udayakumar and Ajithadoss (2010) documented on angiosperm, hydrophytes of five ephemeral lakes of Thiruvallur District, Tamil Nadu. Bhattacharya *et al*. (2011) recorded on aquatic and wetland monocotyledons of Bihar and Jharkhand States. Dabgar (2012) worked on the flora of Wadhvana wetland, Dabhoi Taluka, Gujrat. Kensa (2011) floristic studied in a Vembanur wetland, Kanyakumari District, Tamilnadu, South India. Sambandan and Dhatchnamoorthy (2011) studied the diversity of aquatic macrophytes in Karaikal District, U.T. of Puducherry. Selvamony and Jeeva (2011) made a checklist of angiosperm flora from the wetland of Kanyakumari district, Tamilnadu India. Biswas *et al*. (2012) documented macrophytic flora of Gossaihat Beel, Jalpaiguri forest division, West Bengal. Das (2013) worked on a diversity of aquatic and wetland angiosperms macrophytes in the Kamrup District, Assam, India.

Hooker (1872–1897) and Cowan and Cowan (1929) previously worked on the foothill portion of East Himalayan and of Duars in West Bengal. Grierson and Long (1983–2001), Noltie (2000), Das et al. (2010) worked on the flora of Duars region and Das et al. (2003) worked on the floral structure of the adjoining Jaldapara Wildlife Sanctuary (now Jaldapara National Park). Bandyopadhyay and Mukherjee (2005) prepared a comprehensive investigation of aquatic plants of Cooch Behar district. Biswas (2013) arranged another floristic diversity survey of *Rasik Bill* and its adjacent areas in Cooch Behar district of West Bengal, India. The phytosociological studies have been done by different workers. Das and Lahiri (1997) studied on phytosociological studies of the ground flora in different types of vegetation on Tiger Hill, Darjeeling district, West Bengal. Saha (2003) studied plant association and stratification studies in the forests of the Singalila

range, Darjeeling. Das and Samanta (2006) studied the phytosociological status on *Typha elephantine* in Midnapore district, West Bengal. Sasmal and Mondal (2013) worked on phytosociological studies of aquatic hydrophytes in Purba Medinipur district, West Bengal.

The district of Paschim Medinipur (West Midnapore) is a repository of an extensive variety of flowering plants. It is a sandwich between Odisha in the east, Bankura in the north and the recently divided in Purba Medinipur (East Medinipur) and Paschim Medinipur in the south, this district lies between 22°57'10"N-23°36'35" N and 88°12'40"E- 86°33'50"E, covering an area of 6,728 sq. km. This tract of land that is largely covered with thick forests with immense biological diversity remains largely unexplored from the taxonomical point of view. The heavy rainfall, high humidity, and moderate temperature are collectively responsible for this rich amalgamation of different plant types.

The literature on the flora of the Midnapore district (west) is scanty and scattered. Except for a few explorations done by David Prain (1903) of the whole of East India, no definite work is evident. From this point of view, the aquatic flora of Midnapore (west) remains almost untouched. The vast stretches of water bodies existing within this district, it is sure to add to the rich flora of this district. Hence, the present project aims to undertake a thorough survey of aquatic flora of this district for systematic documentation of the plant species and different categories of hydrophytes growing in the various water bodies, including ponds, lakes, marshy land areas, etc., make a list of plants showing their habit, habitat, flowering period, frequency of occurrence, mode of pollination, etc.

We also emphasize on ethnomedicinal studies. In the last few decades' scientists all over the world are giving more attention to the analysis of new applied science, like Ethnobotany. There are several workers explore ethnomedicinal uses from Tribal and local population. Some of the previous workers are Pal (1980, 1981), Chaudhuri and Pal (1975), Chaudhuri *et*

al. (1977), and others. Bhowmik (1963) has given short ideas of the ethnology of Lodha's of the Midnapur district of West Bengal.

Economically a large number of aquatic plants are useful for their medication as well as food value to the human being. Man has utilized the plant parts like a rhizome, roots, fruits, leaves, etc. in various ways and also for the treatment of various ailments (Bhunia and Mondal, 2009; Shankar and Mishra, 2012). Mandal *et al.* (2016) studied on economically important aquatic Plants from Burdwan district. Mukherjee *et al.* (2016) explored ethnobotanical information of Aquatic and Marshy medicinal plants from South 24 Parganas, West Bengal. However, no particular literature available on Aquatic and Marshy medicinal plants from Paschim Medinipur district.