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Avian distribution in riparian habitat: Records from Nalbari district of Assam, India

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Abstract
The Riparian habitats from Nalbari District of Assam were surveyed from February 2023 to December 2023 period. A total of 47 species of birds in 30 families were recorded. Eighty-seven percent of the avian species recorded were residents and 12% were migrants. Passeriformes dominated the list with 20 species followed by Pelecaniformes with 4 species. Among the observed species, the Greater Adjutant (*Leptoptilos dubius*) and Lesser Adjutant (*Leptoptilos javanicus*) were the IUCN near Threatened. The habitats were also identified as foraging sites of Greater and Lesser Adjutant Storks.

Keywords: Assam, Nalbari district, riparian, landscape, avifauna

Introduction

A riparian zone is defined as an interface between land and a river or stream (Fu *et al*. 2016) [7] which is usually called a river bank. The riparian zones have high value in terms of diversity because they share features of both adjacent upland and aquatic ecosystems (Brooks *et al*. 2003; Hawes and Smith 2005; Frazier 2006) [2, 6, 9]. River channels and adjacent riparian zones play critical ecological roles, which include the support to rich biodiversity. Birds live in floodplains, and riparian zones along a river channel (Wiens 2002) [19]. The riparian zone with its vegetation component, is a complex ecosystem that has a vital role in aquatic and terrestrial habitats (Hawes and Smith 2005; Clinton 2011) [3, 9]. The riparian functions as a corridor that connects separate forests for habitat and movement of terrestrial wildlife (Ramos and Anjos 2014; Miller *et al*. 2015) [14, 16]. Riparian zones also provide conducive dispersal pathways and sufficient cover for migrating birds, thereby supporting a higher diversity of bird species (Sinha *et al*. 2019) [20].

Along with urban development, the pressure of conversion of riparian land in urban areas is getting higher. There has been a decline in riparian vegetation and an increase in built and agricultural land (Fu *et al*. 2016) [7]. Freshwater habitats are considered to be among the most threatened (Dudgeon *et al*. 2006) [5], with riverine habitats increasingly being subjected to large-scale modifications resulting in the loss of their ecosystem services and wider repercussions for associated biodiversity. Changes in riparian land use due to human pressure can disrupt the diversity of flora and fauna (Semiun *et al*. 2013; DeCecco and Brittingham 2016).

Birds are components of the ecosystem that have an important role, including controlling insect populations, helping with pollination of flowers and seed dispersal, as well as helping forest regeneration process, including in urban areas (Hadinoto *et al*. 2012). Birds are one of the environmental bio-indicators because they have a high sensitivity to environmental changes (Krisanti *et al*. 2017) [12]. The conversion of riparian green areas can reduce the diversity of tree and bird species. Birds are forestanding species of global biodiversity found in every habitat (Olechnowski 2009) [15] and are key indicators of ecosystem health and stress (Taper *et al*. 1995) [18]. Habitat heterogeneity is paramount for avian diversity and distribution (Karr 1976; Manhaes and Loures-Ribeiro 2005) [10, 13]. The aim of the study is to understand the distribution pattern of avifauna along riparian habitats from Nalbari district of Assam.

Material and Methods

StudyArea

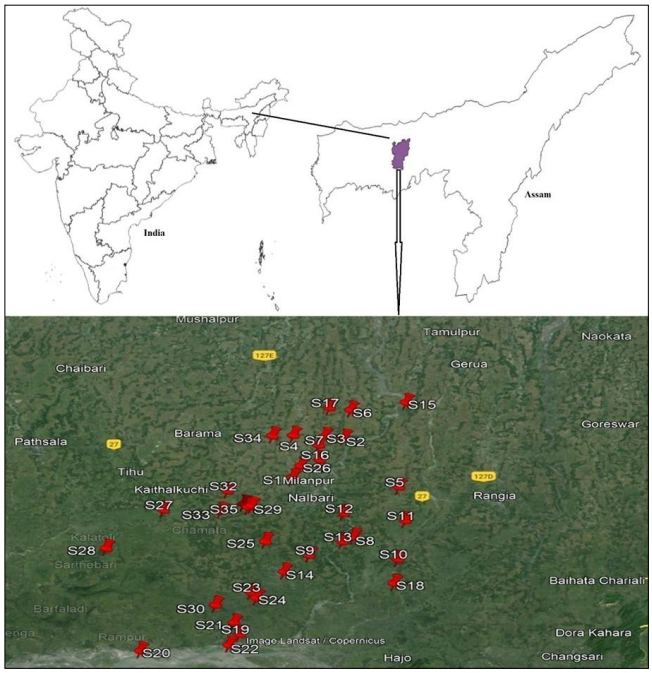

Fig 1: Map of the study area

The study on the distribution of riparian avifauna was conducted between February 2023 to December 2023 in Nalbari, a district of Assam occupies an area of 2287 km^2 and is situated between 26^{o}N and 26^{o}51′ N latitude and 91^{o}E and 91^{o}47′E longitude.(District website, govt.of Assam).The north and west side of the district is bounded by Baksa and Barpeta district respectively. The southern and eastern side of the district is bounded by Kamrup district. The entire area of the district is situated at the plains of the Brahmaputra

Valley. The tributaries of the Brahmaputra, namely Nona, Buradia, Pagaldia, Borolia and Tihu originate from the foothills of the Himalayan Mountain range in Tibet. The soil is diverse, and the northern part of the district is clayey and loamy where as the middle part is loamy and sandy. The southern part of the district is composed of sandy soil. The district has a sub-tropical climate with semi dry hot summer and cold winter. The study of the avifauna was done in a total 35 riparian sites of the Nalbari district.

Methods

The field surveys were conducted in the 35 riparian sites from February 2023 to December 2023 for the documentation of avifauna in the Nalbari district. Each site was intensely surveyed for at least 30-40 minutes duration. The field surveys were done from 7.00-9.00 AM and 3.00-5.00 PM depending on the day length. Wetlands, canals, ponds, grasslands, and villages near riparian sites within a 500m radius were used to cover the survey locality.

Following visual observations with the help of a binocular (Nikon ACULON A211, 12×50), the presence of birds was noted and photographs were taken with a digital camera (Nikon Coolpix P500). On some occasions, bird calls were used as an identifying feature to locate and to click photographs. Based on observations and photographs, the birds were identified (Grimmett *et al*. 1998; Kazmierczak and van Perlo 2000; Ali 2002) [1, 11] and recorded for checklist and analysis.

Results and Discussion

A total of 47 avian species under 30 families were observed in the survey (Table 1). Selected bird species are shown in the (Fig. 2). The data reflects that maximum number of species (42%) were under the order Passeriformes. Ardeidae family shows highest number of species (4) amongst all the orders (Fig. 3). Out of total species 87% were resident and 12% were migrant. Two species were Near Threatened and rest were in IUCN Least Concern category.

Riparian areas located near the settlements showed moderate richness. Among the observed numbers of bird species, majority are resident in Nalbari district, while only a few are migrant. Irrespective to the riparian habitats, Passeriformes were dominant, and a single representative group apart from the Apodiformes, Suliformes, Gruiformes, Accipitriformes and Bucerotiformes.

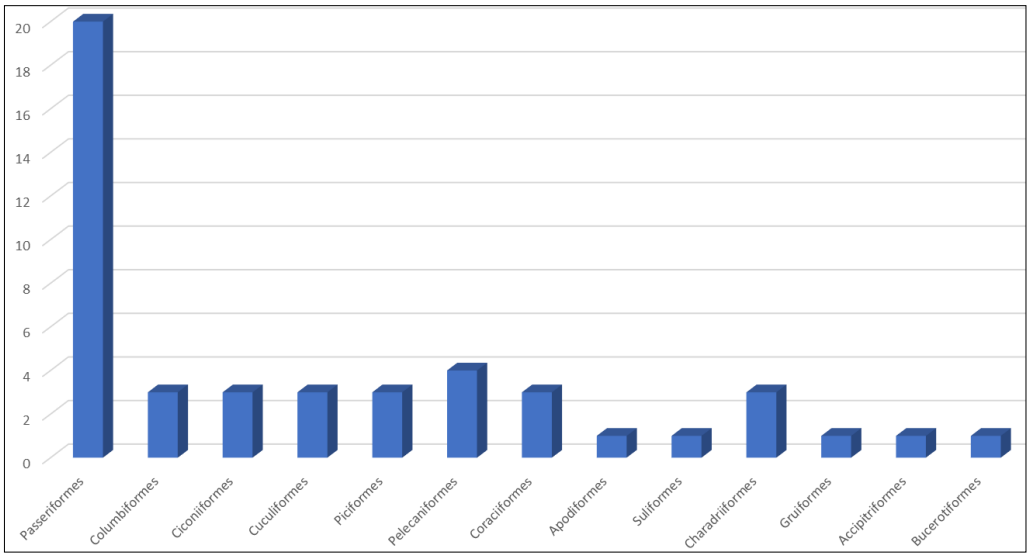

Fig 2: Order wise species composition

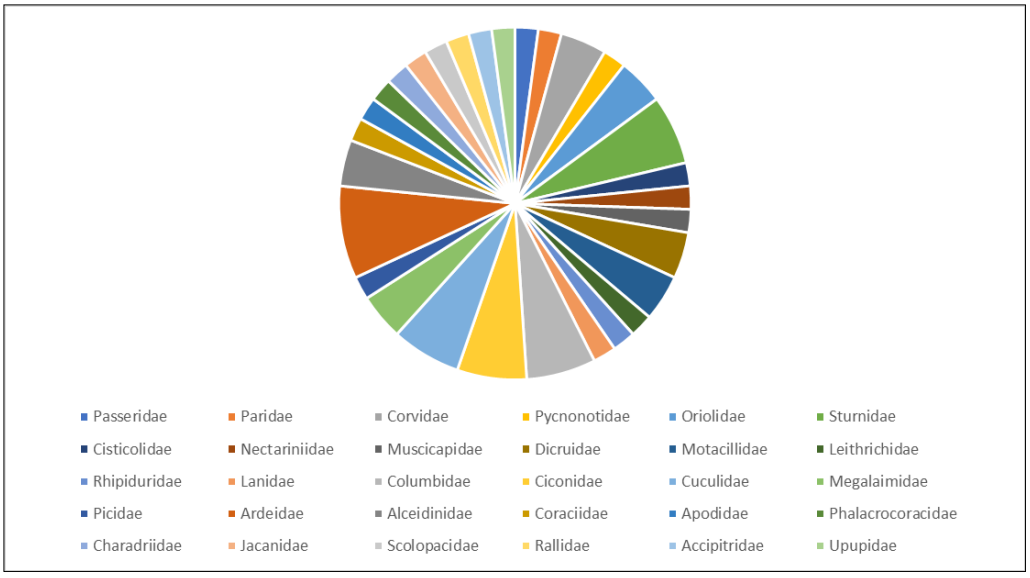

Fig 3: Family wise species composition

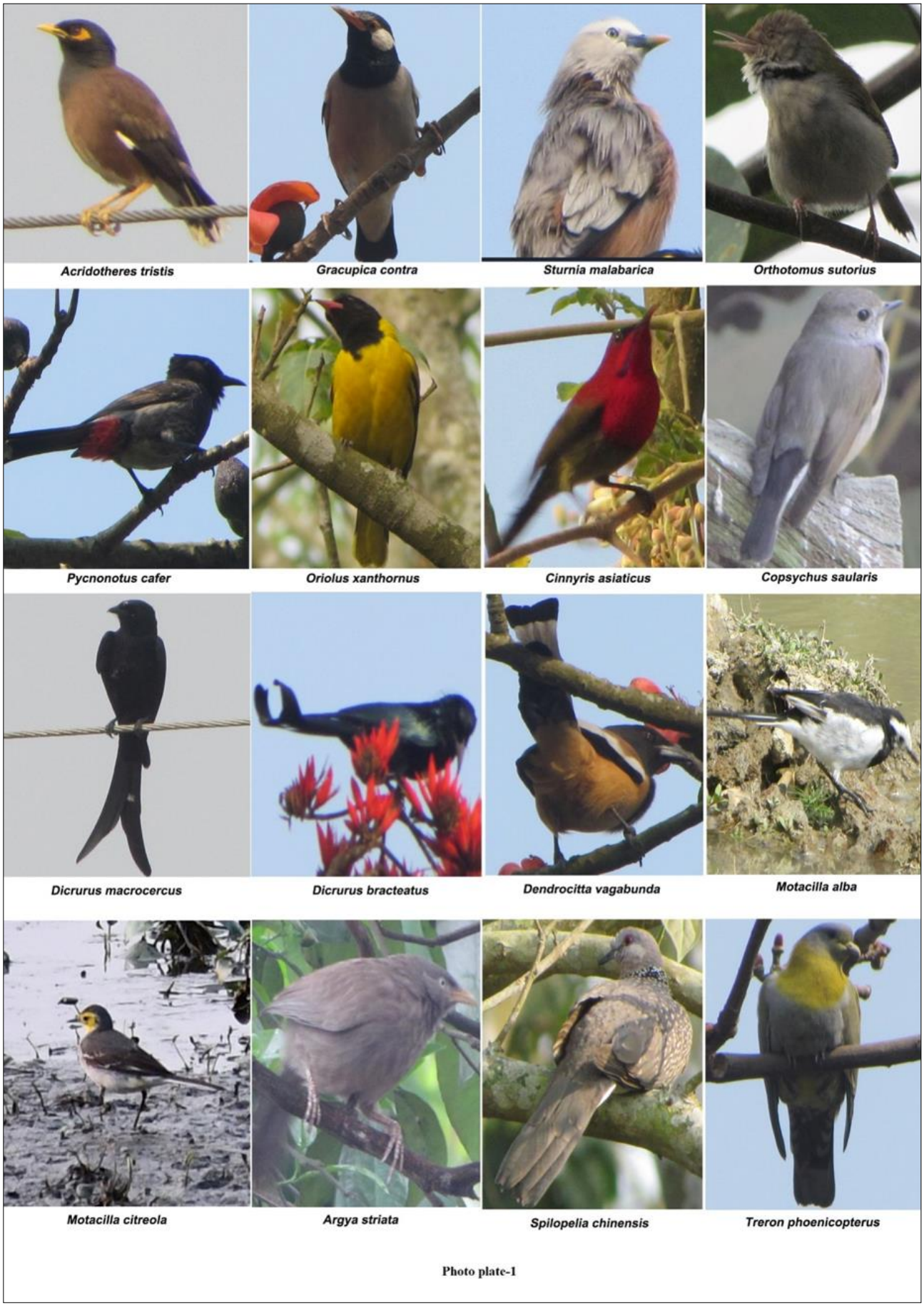

Photo plate-1

Photo plate-2

Table 1: Checklist of riparian birds recorded from the study area

SL. No.	Common Name	Scientific Name	Order	Family	IUCN Status	Resident Status
1	House Sparrow	*Passer domesticus* (Linnaeus,1758)	Passeriformes	Passeridae	LC	R
2	Cinereous Tit	*Parus cinereus* (Vieillot,1818)	Passeriformes	Paridae	LC	R
3	Large-billed Crow	Corvus macrorhynchos (Wagler,1827)	Passeriformes	Corvidae	LC	R
4	Red-vented Bulbul	*Pycnonotus cafer* (Linnaeus,1766)	Passeriformes	Pycnonotidae	LC	R
5	Black-hooded Oriole	*Oriolus xanthornus* (Linnaeus,1758)	Passeriformes	Oriolidae	LC	R
6	Common Myna	*Acridotheres tristis* (Linnaeus,1766)	Passeriformes	Sturnidae	LC	R
7	Asian Pied Starling	*Gracupics contra* (Linnaeus,1758)	Passeriformes	Sturnidae	LC	R
8	Chestnut-tailed Starling	*Sturnia malabarica* (Gmelin,1789)	Passeriformes	Sturnidae	LC	R
9	Common Tailor Bird	*Orthotomus sutorius* (Pennant,1769)	Passeriformes	Cisticolidae	LC	R
10	Purple Sunbird	*Cinnyris asiaticus* (Latham,1790)	Passeriformes	Nectariniidae	LC	M
11	Oriental Magpie Robin	*Copsychus saularis* (Linnaeus,1758)	Passeriformes	Muscicapidae	LC	R
12	Black Drongo	*Dicrurus macrocercus* (Vieillot,1817)	Passeriformes	Dicruridae	LC	R
13	Spangled Drongo	*Dicrurus bracteatus* (Gould,1843)	Passeriformes	Dicruridae	LC	R
14	Rufous Treepie	*Dendrocitta vagabunda* (Latham,1790)	Passeriformes	Corvidae	LC	R
15	Pied Wagtail	*Motacilla alba* (Linnaeus,1758)	Passeriformes	Motacillidae	LC	M
16	Citrine Wagtail	*Motacilla citreola* (Pallas,1776)	Passeriformes	Motacillidae	LC	M
17	Indian Golden Oriole	*Oriolus kundoo* (Sykes,1832)	Passeriformes	Oriolidae	LC	M
18	Jungle Babbler	*Argya striata* (Dumont,1823)	Passeriformes	Leiothrichidae	LC	R
19	White-throated Fantail	*Rhipidura albicollis* (Viellot,1818)	Passeriformes	Rhipiduridae	LC	R
20	Brown Shrike	*Lanius cristatus* (Linnaeus,1758)	Passeriformes	Laniidae	LC	M
21	Spotted Dove	*Spilopelia chinensis* (Scopoli,1786)	Columbiformes	Columbidae	LC	R
22	Yellow-footed Green Pigeon	*Treron Phoenicopterus* (Latham,1790)	Columbiformes	Columbidae	LC	R
23	Rock Pigeon	*Columba livia* (Gmelin, JF,1789)	Columbiformes	Columbidae	LC	R
24	Greater Adjutant Stork	*Leptoptilos dubius* (Gmelin, JF, 1789)	Ciconiiformes	Ciconidae	NT	R
25	Lesser Adjutant Stork	*Leptoptilos javanicus* (Horsfield,1821)	Ciconiiformes	Ciconidae	NT	R
26	Asian Openbill	*Anastomus oscitans* (Boddaert,1783)	Ciconiiformes	Ciconidae	LC	R
27	Asian Koel	*Eudynamys scolopaceus* (Linnaeus,1758)	Cuculiformes	Cuculidae	LC	R
28	Common Hawk Cuckoo	*Hierococcyx varius* (Vahl,1797)	Cuculiformes	Cuculidae	LC	R
29	Indian Cuckoo	*Cuculus Micropterus* (Gould,1838)	Cuculiformes	Cuculidae	LC	R
30	Blue-throated Barbet	*Psilopogon asiaticus* (Latham,1790)	Piciformes	Megalaimidae	LC	R
31	Lineated Barbet	*Psilopogon lineatus* (Vieillot,1816)	Piciformes	Megalaimidae	LC	R
32	White-napped Woodpecker	*Chrysocolaptes festivus* (Boddaert,1783)	Piciformes	Picidae	LC	R
33	Little Egret	*Egretta garzetta* (Linnaeus,1766)	Pelecaniformes	Ardeidae	LC	R
34	Great Egret	*Ardea alba* (Linnaeus,1758)	Pelecaniformes	Ardeidae	LC	R
35	Cattle Egret	*Bubulcus ibis* (Linnaeus,1758)	Pelecaniformes	Ardeidae	LC	R
36	Indian Pond Heron	*Ardeolagrayii* (Sykes,1832)	Pelecaniformes	Ardeidae	LC	R
37	White-throated Kingfisher	*Halcyon smyrnensis* (Linnaeus,1758)	Coraciiformes	Alceidinidae	LC	R
38	Common Kingfisher	*Alcedo atthis* (Linnaeus,1758)	Coraciiformes	Alceidinidae	LC	R
39	Indian Roller	*Coracias benghalensis* (Linnaeus,1758)	Coraciiformes	Coraciidae	LC	R
40	Asian Palm Swift	*Cypsiurus balasiensis* (J.E. Gray,1829)	Apodiformes	Apodidae	LC	R
41	Little Cormorant	*Microcarbo niger* (Vieillot,1816)	Suliformes	Phalacrocoracidae	LC	R
42	Red-wattled Lapwing	*Venellus indicus* (Boddaert,1783)	Charadriiformes	Charadriidae	LC	R
43	Bronze-winged Jacana	*Metopidius indicus* (Latham,1790)	Charadriiformes	Jacanidae	LC	R
44	Wood Sandpiper	*Tringa glareola* (Linnaeus,1758)	Charadriiformes	Scolopacidae	LC	M
45	White-breasted Waterhen	*Amaurornis phoenicurus* (Pennant,1769)	Gruiformes	Rallidae	LC	R
46	Black Kite	*Milvus migrans* (Boddaert,1783)	Accipitriformes	Accipitridae	LC	R
47	Common Hoopoe	*Upupa epops* (Linnaeus,1758)	Bucerotiformes	Upupidae	LC	R
R-Resident, M-Migrant, LC-Least Concern, NT-Near Threatened						

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