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Nesting and Breeding of Common coot (*Fulica atra)* (Aves: Rallidae) in Ujani-Bhigwan reservoir Maharashtra, India

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Abstract

In present investigation nesting and breeding of common coot (*Fulica atra*) from Ujani-Bhigwan reservoir, Maharashtra, India. Total 56 nests were observed in study area, in which 31 eggs and 68 chicks were observed. Parameters such as depth of water, nest distance from river bank, shape of nest and nest material were assessed in this research. Nest construction, Parental care, and feeding to youngones are contributed by both of parents. The *Typha angustifolia* and *Ipomoea carnea* was main base for the nest construction of common coot (*Fulica atra*). Predator, over fishing, pollution, illegal sand mining, tourist activities and anthropogenic activity are threats identified to the nest of common coot (*Fulica atra*). It is an important primary data-base for this nesting site of Common coot with major details fist-time.

Key words - Bird Nest, Common coot, Nest Material, Ujani-Bhigwan reservoir, Nesting ecology.

Introduction

Birds are crucial for the functioning of the world ecosystem (Balen, 1989) and these are sensitive to environmental changes (Kushlan, 1993) and they play important role in health of human (Chavan et al., 2023). In India, 12% of the 1395 bird species are already facing series impact by habitat loss that includes decreased water bodies, wetlands and forests (ENVIS-BNHS). Overexploitation, unsustainable resource use, population growth and climate change have led to a loss of biodiversity. These changes are causing negative impacting the life cycle and survival of migratory birds.

The Ujani reservoir Wetland was created in 1980 and is situated in the Western Ghats' rain shadow zone. With an annual rainfall of 500mm, it has a catchment area of 14,856 sq. km and water spread area of reservoir 357 sq. km. Since the completion of this dam for drinking water in 1980, water has also been made available for irrigation supporting the growth of cash crops. Since 1980 it has supported 230 local, migratory visitors and transit avifauna, According to a recent declaration as an established Important bird area (IBA) area (Chavan et al., 2020). Freshwater wetlands are at danger because of eutrophication, pollution, a drinking water shortage and poor water quality(Baisthakur et al., 2021; Darak et al., 2021; Puri et al., 2023). The Ujani-Bhigwan Reservoir also supports a huge number of local water birds, waders as well as migratory visitors and transit passenger birds making it an essential element of the wetland ecosystem. Bird constructs various types of nest for protection against environmental factor, breeding process and to care of the brood, birds construct nest with the help of material which is available locally(Jadhav et al., 2018). Common coot (Fulica atra) is a water bird, categorized as "Least Concern (LC)" under the IUCN bird database. It is a

member of the Family: Rallidae and order: Gruiformes of waterbirds. It is monogamous and highly social in the winter and during the mating season, these become extremely territorial (Cavé et. al, 1989, Samraoui et. al, 2007). In India nesting and foraging behaviors of the Common Coot (*Fulica atra*) was studied in wetlands of Viluppuram District, Tamil Nadu (Pandian, 2022). In wetland of Kutch and Saurashtra, Gujarat (Himmatsinhji et. al, 1991) and Maharashtra (Khacher, 1978) reported nesting near Nasik, Maharashtra. With these few reports of nesting and feeding, there are no any major studies compared to select in the present investigation.

Always there is high possibility of occurrence of few pairs of common coots randomly swimming or may be alone and usually group of 10 to 15 is moving from one segment of waterbody to another in synchronous manners. During mid-day they come out from waterbody on the banks but do not go far away from the land. Once the group choose the habitat for nesting, they choose repeatedly same area. It was observed in the present study that common coot are inhabiting in the Ujani-Bhigwan reservoir in large colony having approximate 150-180 individuals at one nesting habitat. Therefore a common scene in the reservoir. The common coot is dominant in population number as compared to population of other waterbirds in this study area during nesting season. Literature review indicates the breeding season and nest construction of this species was in the month of March-April that commonly found in waterbirds (Pandian, 2022). The intention of present study is to report first time from this selected area about what resources it use in nest construction, also to note the nest density and distance of nest location in correlation with condition of the coastal area, also to know about any potential threats exists or not in the waterbody for the laid eggs, developing and developed chicks, threats to adult birds either from predatory birds, fishing activity, sand-mining, local fisherman, poachers, raptors and reptiles etc. Also our aim was to report major aspects of nest structure and composition, nest density of the observed nesting area. All these issues have not been investigated before in selected study area This will be an useful primary data about major components of Common coot breeding in the Ujani-Bhigwan reservoir area in addition the food and feeding to young once by adult with difference in parental involvement is reported.

Material and methodology

Study area

Ujani-Bhigwan Reservoir (18°04′26″N 75°07′12″E) was the site of the study's location. it is situated on the borders of Solapur, Ahmednagar, and Pune districts of Maharshtra state. It is a well-known tourist destination for the birders and is famed for migratory birds like flamingos. It is called Ujani reservoir because it is a gravity dam made of soil filled with concrete sluice gates close to the settlement of village Ujani and constructed by embanking the river Bhima. It has a 3,140,000,000 M^3 water storage capacity and 2,550,000 acre water spread area. The dam is built on the River Bhima, one of the primary tributaries of the River Krishna that forms the Krishna river basin in western Maharashtra. The parts of Western Ghats, primarily located within the districts of Pune and Ahmednagar in Maharashtra State, is the main catchment area for the waterbody. The reservoir was built between year 1969 to 1980. It was to meet the multifaceted demands for water for the industrial, hydropower, agricultural, and drinking purposes (Chavan et al, 2020).

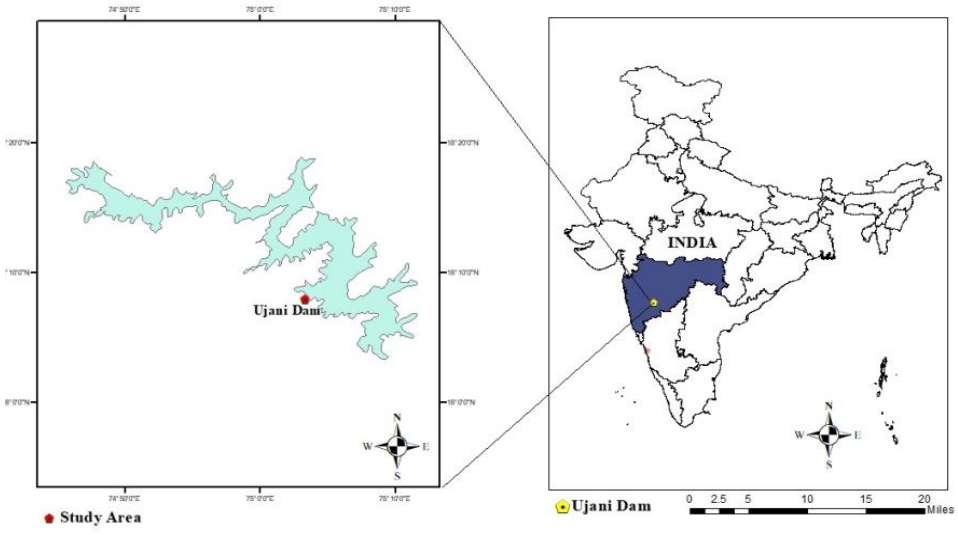


Fig.1.Study area

Method

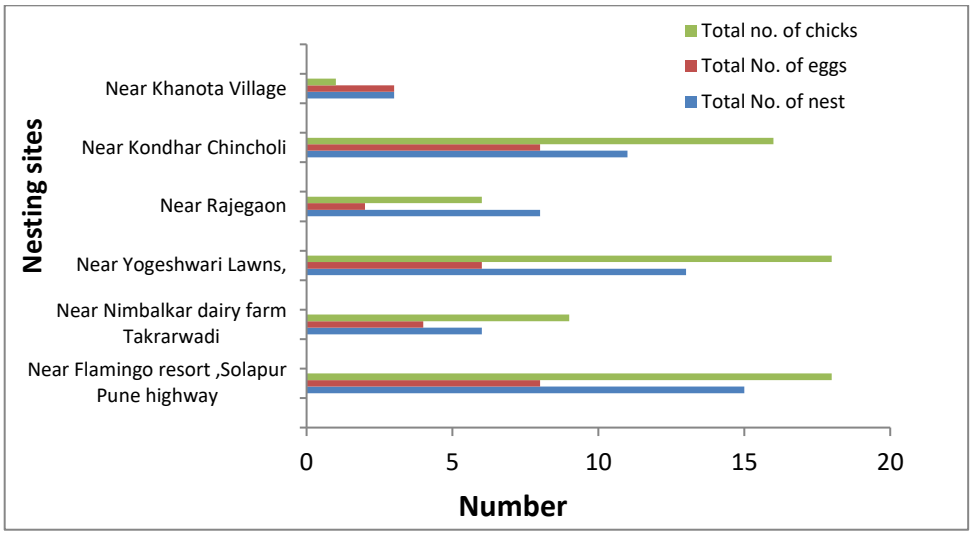
The study was planned in the year 2022-2023. The Study area was visited from July 2022 to July 2023. The marginal area of Ujani reservoir was visited to locate the occurrence of nesting area of Common coot by walk and manually operated Masula type of boat was used for the purpose. Marginal area of this water body was surveyed for the occurrence of hydrophyte species especially *Typha angustifolia* and *Ipomoea carnea*. Distance of nesting area from river bank was measured and located all nests in four different categories as 0 to 10m, 10 to 20m, 20 to 30m, 30 to 40m. Nikon binocular was used for the observation on bird diversity from the unreachable area. Nikon- 1000 Digital Camera was used for the photography of nests to determine nest number, nest structure, nest material used for nest construction, to determine clutch size and chicks under nourishment. Direct observation method was used at few places in a high nest density area. The collected data was tabulated and analyzed using common excel program in the Computers for the statistical analysis.

Result and Discussion

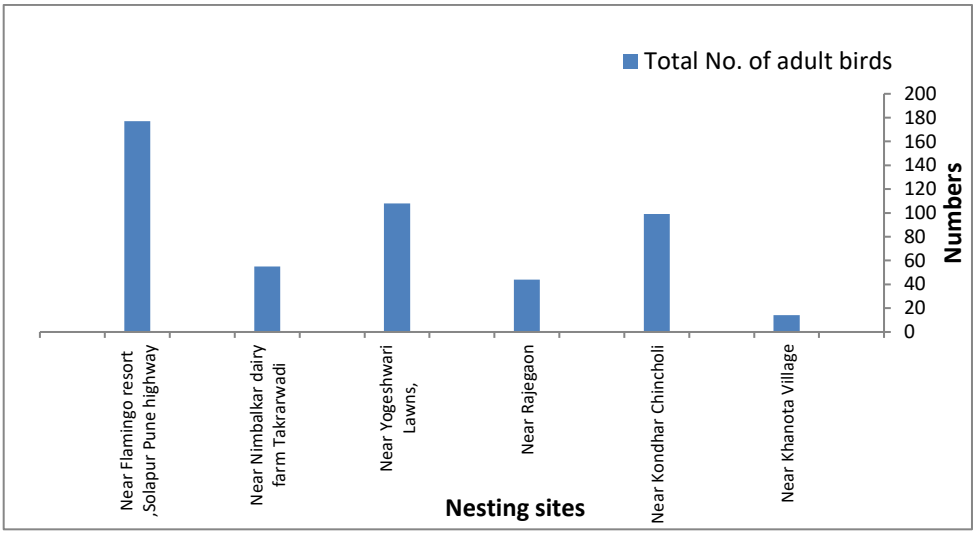
Coots breed in an environment with a plenty of nesting material and they built floating platform types of nest for breeding by using this material. All nests were round in shape made with the help of *Typha angustifolia* or *Ipomoea carnea*. In all total 56 nest of Common coot were observed in study area and those were completely camouflage either in the vegetation of *Typha angustifolia* or *Ipomoea carnea*. All nests were isolated completely from the coast. The nest area was nearly difficult to reach for the predator in reservoir area, due to randomly spread nests in the vegetation of *Typha angustifolia* or *Ipomoea carnea*. From the nest observed in the area (n=56) 50 nest were at 0 to 10m distance from river bank, 05 nests were at 10-20m beyond the river, only 01 nest was present 20-30m distance from river bank but no nest was observed 30-40m distance from river bank. Total 31 eggs and 68 youngones recorded from 56 nests during the study period. For the construction (male and female) in pair used *Typha angustifolia* and *Ipomoea carnea* plant, which was available easily in water body and actively involved in nest construction, feeding and care of youngones. Macrophytes, Gastropod and algae were main food which was available in nesting area. Nest shape was rounded. Egg size nearly equal to size of hen egg and egg colour white with small dot on it. Both male and female parents found to feed the youngones. Parental care includes as nest guarding, chick feeding by both parents; it includes mainly protection of eggs or youngones, feeding of youngones, construction of nest etc. Predators, Pollution, illegal sand mining, human activities like tourist activities, local and tourist transport boat, over fishing, etc. are main threats to nest of Common coot (*Fulica atra*).

Table1: The nest details of Common coot at Ujani-Bhigwan reservoir

Sr. No.	Nesting site	Location	Total No. of nest	Total No. of eggs (Clutch Size)	Total no. of chicks	Total no. of adult birds	Distance from river bank (meter), nest number				Water depth In feet
							0-10	10-20	20-30	30-40	
1	Near Flamingo resort ,Solapur Pune highway	18°16'42"N 74°45'40"E	15	8	18	177	13	02	00	00	3 to 10
2	Near Nimbalkar dairy farm Takrarwadi	18°17'16"N 74°46'27"E	6	4	9	55	06	00	00	00	2 to 8
3	Near Yogeshwari Lawns, Birungadwadi	18°18'50"N 74°47'30"E	13	6	18	108	10	03	00	00	2 to 8
4	Near Rajegaon village	18°20'28"N 74°47'56"E	8	2	6	44	08	00	00	00	1 to 8
5	Near Kondhar Chincholi village	18°17'27"N 74°49'03"E	11	8	16	99	10	00	01	00	3 to 8
6	Near Khanota Village	18°19'38"N 74°49'23"E	3	3	1	14	03	00	00	00	2 to 10
	Total		**56**	**31**	**68**	**497**	**50**	**05**	**01**	**00**	



Graph.1. Total no. of Nests, eggs and chicks found at identified nesting area of Common coot



Graph.2. Total number of adult birds found at various nesting sites.

Over 50% of wetlands worldwide have been lost in the past century and human activities have led to various degrees of degradation these are negatively impacting waterbirds that relying on wetland habitats. In present study 497 adult coots found in different six location of study area and total 56 nests were observed. The Ujani-Bhigwan reservoir contains wide range of food for both parents and chicks. Nesting material for construction was available in plenty amount in this reservoir. Special management plan is required for fishing and sand mining in particular area of this reservoir to avoid disturbance in coot nesting. In the present study all nests were associated with *Typha angustifolia* or *Ipomoea carnea* to lower the risk of predation. Same result was found by Samraoui et al., (2007) in the semi-arid Hauts-Plateaux region of north eastern Algeria, a small pond called Timerganine was used to study the reproductive biology of the Common coot (*Fulica atra*) they found that *Phragmites australis* was linked to Common Coot nests, most likely to lower the risk of aerial predators. Squalli et al., (2020) studied breeding habitats and ecology of Common coot in Fez region Morocco; they found Pollution, Fishing, Urbanism and Tourism were main threats to the nesting of Common coot (*Fulica atra*) which are same mentioned in present research. The wetlands of Viluppuram District, Tamil Nadu, Pandian (2022) studied nesting and breeding of Common coot in India and he observed total of 4054 Common Coots count, comprising 467 juveniles and 1327 nests. Of the 1327 nests, 136 were constructed in open water and 1,191 on *Ipomoea carnea* vegetation; he also found that snails, insects, algae and macrophytes are main source of food of Common coot (*Fulica atra*), Jadhav et al., 2022 found that freshwater invertebrates play important role in bird feeding, that resembles with present study.

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Conflict of interest

No conflict of interest was reported by the authors

Fig.2. Common coot carry *Typha angustifolia* leaves for nest construction

Fig.3. Common coot nest site *Ipomoea carnea* as support and typha as nest material.

Fig.4. Common coot nest with exclusively *Typha angustifolia*. as nest material.

Fig.5. Parent coot in nest construction using *Typha angustifolia*.

Fig.6. Common coot nest with fresh laid eggs

Fig.7. Common coot nest with clutch size 03

Fig.8. Common coot nest with developing chicks

Fig.9. Common coot chicks

Fig.10. Common coot parents and chicks

Fig.11. Common coot chicks in advanced stage

Fig.12. Common coot feeding gastropod to chicks

Fig.13. Common coot chicks in advanced stage free swimming

Fig.14. Overfishing of small sized fish in Ujani-Bhigwan reservoir

Fig.15. Sand mining activity in the reservoir

References

1. Baisthakur, P. O., Darak, O. S., Nagrale, N. G., & Barde, R. D. (2021). Devising Conservation Strategy for the Freshwater Crab Barytelphusa Guerini in Godavari and its Tributaries in Marathwada , Maharashtra , India. *Annals of R.S.C.B.*, *25*(6), 3153–3159.
2. Balen, 1989. Biological Control of Pests in Tropical Agricultural Ecosystems, Deportment of Nature Co:nservotion Foculty of Forestry, Bogor Agricallural University Bogor, Indonesia.
3. Cavé, A. J., Visser, J., & Perdeck, A. C., 1989. Size and quality of the coot Fulica atra territory in relation to age of its tenants and neighbours. Ardea, 77(1), 87-98.
4. Chavan, S. and Kumbhar, A., 2020. Breeding ecology of river tern (Sterna aurantia) at Ujjani-Bhigwan reservoir bird sanctuary near Pune-Solapur Highway, India. Asian Journal of Conservation Biology, 9, p.2.
5. Chavan, S., Lad, B., Sukare, V. and Jadhav, M. 2023. Antibiotic spectrum of bacteria isolated from gut sample ofColumba livia(Rock dove)species. Bull. Env. Pharmacol. Life Sci., Spl Issue [1]: 2023:472-474.
6. Darak, O. S., Baisthakur, P. O., Nagrale, N. G., & Barde, R. D. (2021). Analysis of Adaptive Ecological Factors for Quantification of Environmental Thresholds in Fresh Water Crab Barytelphusaguerini in the Tributaries of Godavari River in Maharashtra , India. *Annals of R.S.C.B.*, *25*(6), 3160–3173.
7. Gullion, G. W., 1954. The reproductive cycle of American Coots in California. The Auk, 71(4), 366-412.
8. Himmatsinhji, M.K., S.N. Varu & N.N. Bapat, 1991. Occurrence, status and breeding of Podiceps cristatus (Linn.) and Fulica atra Linn. Journal of the Bombay Natural History Society 88(3): 439–441.
9. Khacher, L., 1978. The Coot Fulica atra (Linn.) nestng near Nasik, Maharashtra. Journal of the Bombay Natural History Society 74(3): 525.
10. Kushlan J. A., 1993. Colonial waterbirds as bioindicators of environmental change. Colonial Waterbirds 16(2): 223–251.
11. Mahesh Jadhav, Rajesh Achegawe, Shivaji Chavan, 2022 "Review on Importance of Freshwater Invertebrates on Birds Feeding", International Journal of Scientific Research in Science and Technology (IJSRST), Volume 9 Issue 6, pp. 255-261.
12. Mahesh, J., Shivaji, C. and Pooja, P., 2018. Nests and nest materials of birds in SRTM University area at Nanded, Maharashtra State. Int. J. Of Fauna and Bio. Studies, 5(2-C), pp.140-147.
13. Pandian, M., 2022. Notes on the nesting and foraging behaviours of the Common Coot Fulica atra in the wetlands of Viluppuram District, Tamil Nadu, India. Journal of Threatened Taxa, 14(11), pp.22139-22147.

14. Puri, D. G., Baisthakur, P. O., Jagtap, H. S., & Bharti, S. S. (2023). Impact of Water Quality on Growth of Catla catla in a Biofloc System. *Journal of Emerging Technologies and Innovative Research*, *10*(6), 495–503.
15. Samraoui, F. and Samraoui, B., 2007. The reproductive ecology of the Common Coot (Fulica atra) in the Hauts Plateaux, northeast Algeria. Waterbirds, 30(1), pp.133-139.
16. Squalli, W., Mansouri, I., Dakki, M., & Fadil, F., 2020. Nesting habitat and breeding success of Fulica atra in tree wetlands in Fez's region, central Morocco. Journal of Animal Behaviour and Biometeorology, 8(4), 282-287.
17. Zhang, W., Liu, W., & Ma, J., 2011. Territory and territorial behavior of migrating Common Coot (Fulica atra). *Journal of Forestry Research*, *22*, 289-294.