

Establishment of the relationship between Indian Skimmer and their foods

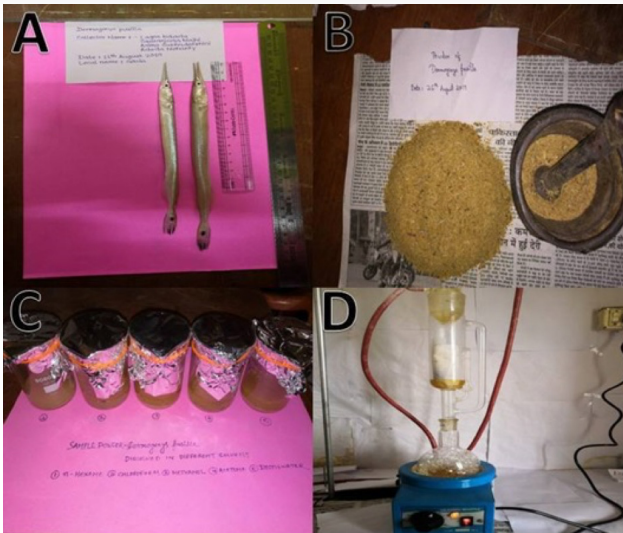
Rapid urbanization, habitat fragmentation, and transformation of natural habitat for human settlement and other anthropogenic activities have resulted in a significant loss of biodiversity. Today, most of the riverine birds are found to be in the verge of endangerment. Particularly in Odisha state, there are about 568 bird species recorded, and from them, about 27 species are globally threatened, including 16 riverine birds (Birdlife International 2014). The Indian Skimmer (IS) or Indian Scissors-bill is one of the threatened riverine birds of Odisha state. It is found along stretches of large rivers, swamps, lakes, and estuaries. In Odisha, it is reported from Bhitarkanika, Satkosia, Dhamra, Nalabana, and Mundali. Mundali is an important breeding site in Odisha (Rajguru 2017). Indian Skimmer does not swim or dive, rather feeds on calm water by skimming the surface with its lower mandible (Whistler 1949). IS feeds on fauna that are



Indian Skimmers searching food. © Sanjeet Kumar.

present on the water's surface. They feed mainly on small fishes. However, their diet includes some small insects, insect's larvae, and crustaceans (Gochfeld & Burger 1994; Hammerson & Cannings 2006). Rajguru (2017) has documented that

IS feeds five major fish species near Mundali. These are *Salmophasia bacaila* (Jalla), *Salmophasia sardinella* (Sana jalla), *Stystomous sarana* (Jalla bedi), *Pethia ticto* (Kerandi), and *Dermogenys pusilla* (Gania). This present study is focused on analyzing



Experimental works on food of Indian Skimmer: A—*D. pussila* | B—Powder of fish sample | C—Extracts | D—Extraction.

the biochemical nature of a particular fish, *D. pusilla* and to find out secondary metabolites present in the fish that may be responsible for the breeding behavior of the bird and ultimately lead to its survival. *D. pussila* is selected for experimental works. It is locally called Gania in the Odia language. Keeping in mind, the importance of surface fish in breeding of IS, an attempt has been taken to analyze the secondary metabolites of *D. pussila* extracts in order to find out the presence of bioactive compounds that might be responsible to trigger the hormones or behaviors for mating or breeding. It could be useful to make conservation plan through feeding behavior of IS.

For validation of the role of secondary metabolites presence in *D. pussila*, a field survey was carried out, followed by phytochemical screening and thin layer chromatography (TLC) of potent extracts. During 2018–2020, information on Indian Skimmer and their ecological behavior was gathered from the

fishing communities. The fish (*D. pussila*) was identified using published literature (Rajguru 2017). The extraction, qualitative analysis of secondary metabolites, and TLC analysis were carried out using standard methods (Kumar et al. 2013).

The field observations during surveys revealed that IS consumes mainly five types of surface fish species in Mundali areas of Odisha state. It was also seen that those fishes abundantly found during the breeding season. Rajguru (2017) reported that their food habit comprises mainly of five different types of surface feeding fish species, some crustaceans, and other small invertebrates. It was noticed that the most common consumed fish was *D. pussila* by IS. The phytochemical analysis of *D. pussila* extracts (n-hexane, chloroform, methanol, acetone, and aqueous) revealed that methanol extracts showed the presence of tannin, saponins and terpenoids while steroid is only observed in aqueous extract. The TLC analysis also showed spot in polar-non polar mobile phase (Chloroform: Methanol; Rf: 0.69). The presence of terpenoids and steroids might be helpful in triggering hormones that can induce breeding in IS. Such similar type of works carried out by Grootuis & Schwabi (2008) and they reported that steroid hormones play an important role in offspring development whereas in 2016, Rivas et al. (2016) described the role of steroid hormones in avian follicles. Rout et al. (2019) and Das et al. (2019) worked on the correlation between food habits and breeding behavior of IS and reported that there are certain bioactive compounds present in the foods (*Salmophasia bacaila* and *Pethia ticto*) of

IS which might play a role in its breeding and egg laying activities.

The Indian Skimmer is a vulnerable and extremely poorly studied avifauna. The present study showed that the secondary metabolites present in the foods of IS might play an important role in their breeding behaviors. Therefore, a conservation strategy is needed for the food of IS in their breeding habitat. Further, more exploration works and advance research on the foods of Indian Skimmer is urgently needed to address their conservation.

References

- Birdlife International (2014).** *Species factsheet: Rynchops albicollis*. <http://www.birdlife.org>.
- Das, S., N.R. Singh, S.K. Biswal & S. Kumar (2019).** Scientific correlation between feeding behavior of *Rynchops albicollis* and *Pethia ticto*: A case study on a vulnerable avian species of Odisha. In: Kumar, S., S.K. Biswal, S. Mishra, N.R. Singh, P. Balakrishnan, N.K. Kumawat & N.K. Dhal. *Medico-Biowealth of Odisha*. APRF Publisher, Bhubaneswar, India.
- Gochfeld, M. & J. Burger (1994).** *The Birds of North America Online, Black Skimmer*. Cornell Lab of Ornithology, Ithaca.
- Groothuis, G.G.T. & H. Schwabi (2008).** Hormone-mediated maternal effects in birds: mechanisms matter but what do we know of them?. *Philosophical Transactions of the Royal Society B Biological Sciences* 363(1497): 1647–1661.
- Hammerson, G. & S. Cannings (2006).** *NatureServe explorer (On-line) Comprehensive Report Species-Rynchops niger*. <http://www.natureserve.org/explorer>.
- Kumar, S., K. Jyotirmayee & M. Sarangi (2013).** Thin layer chromatography: A tool of biotechnology for isolation of bioactive compounds from medicinal plants. *International Journal of Pharmaceutical Sciences Review and Research* 18(1): 126–132.
- Rajguru, S.K. (2017).** Breeding biology of Indian Skimmer *Rynchops albicollis* at Mahanadi River, Odisha, India. *Indian Birds* 13(1): 1–7.
- Rivas, R.E.C., M.P.C. Nieto & M. Kamiyoshi (2016).** Effect of steroid hormone in Avian Follicles. *Asian-Australasian Journal of Animal Sciences* 29(4): 487–499.
- Rout, M., R.S. Devi, S.K. Rath, S.K. Biswal & S. Kumar (2019).** Correlation between food of the Indian skimmer and its behavior. In: Kumar, S., S.K. Biswal, S. Mishra, N.R. Singh, P. Balakrishnan, N.K. Kumawat & N.K. Dhal. *Medico-Biowealth of Odisha*. APRF Publisher, Bhubaneswar, India.
- Whistler, H. (1949).** *Popular Handbook of Indian Birds, 4th ed.* Gurney and Jackson, London.

Acknowledgements

Authors are thankful to local communities of Mahanadi river areas, Cuttack.

Lagna Bebarta¹, Sauranjeeta Majhi², Asima Subhadarshini³, Ashrita Mohanty⁴ & Sanjeet Kumar⁵

¹⁻⁵ Biodiversity and Conservation Lab, Ambika Prasad Research Foundation, Bhubaneswar, Odisha 751006, India.

Email: ⁵sanjeet.biotech@gmail.com (corresponding author).

Citation: Bebarta, L., S. Majhi, A. Subhadarshini, A. Mohanty & S. Kumar (2023). Establishment of the relationship between Indian Skimmer and their foods. *Bird-o-soar* #209, In: *Zoo's Print* 38(8): 22–24.