

Interdependence of Medicinal Plants And Birds-A General Discussion

Atmaja Avirupa Das¹, Debabrata Das²

²Dept of Botany

¹Vidyasagar Shishu Niketan (H.S.), Paschim Medinipur, West Bengal, 721102

²Govt. General Degree College, Lalgarh, Jhargram, 721516

Abstract- Medicinal plants are important for human beings but the use and practice of these plants and their products in the community of avifauna is important too. Birds and plants are interdependent on each other in many ways. They play a key role to disseminate propagules of many valuable plants including medicinal plants in wild habitats. The ecosystem is governed by many factors; among them one important factor is biotic interactions. Mobilization of resources and establishment of many living components is a key process for ecosystem management. Depending upon climatic factors, habitat structure and functions change their seral communities in which birds play a major role. In woodlands, forests, wetlands, grasslands, dumping grounds, degraded lands, coastal areas, mangrove forests, marshy areas, meadows, agricultural lands, hills, mountains, deserts and many more man-made ecosystems a majority of producers depend upon carriers or messengers that disperses seeds, plantlets, propagules and other vegetative parts of plants to make a complete ecosystem. Among many carriers birds are one of the most important group that use plants their parts directly as food and fodder. Birds not only use plant materials as food but also as insect repellents in their nests to protect their eggs and chicks from various parasites and insects like blood sucking fleas etc. Some birds choose insect repellent resins like pine boughs for nest construction (Bonelli's eagle). Corsican blue tits use aromatic plant materials like lavender, mint and aster etc. for nesting. In our area we see a large category of birds use *margosa*, *Eucalyptus*, *Odina*, *Bridelia*, *Vanda* etc. leaves and twigs in their nests during nest construction. Plant materials and plant parts that have been used by birds for various purposes need attention for future research on medicinal plants as interdisciplinary research throughout the world. In this paper authors have represented a vivid example along with good explanation regarding interdependence of medicinal plants and birds.

Keywords- Avifauna, medicinal plants, inter-dependence study, management.

I. INTRODUCTION

Birds are interesting creatures which are so called avifauna. Medicinal plants are plants that act as medicine for our ailments and illness. Research says that almost all plants are medicinal in many ways. For birds also these plants are of many uses. Birds and plants are also interdependent on each other. Directly or indirectly they help us to make a complete bridge between human and plants to govern the ecosystem process. Birds use and eat many fruits or other parts of plants. Plants also get carbon-dioxide from bird which they use in the process of photosynthesis; birds also help in pollination and dispersal of fruits and seeds of many plants. They also protect the plants from pests such as insect larvae which can damage the parts of a plant. A wide spectrum of use of medicinal plants in bird community and dissemination of fruits and seeds by them are versatile. Frugivorous birds like Asian koels, red vented bulbuls etc eat the fruits of different plants including medicinal plants. The seeds of these fruits eaten by frugivorous birds are dispersed away from the parent plant. Bird Cherry, a plant of the family rosaceae (*Prunus padus*) also called as "mayday tree" have evolved along with a few number of birds, reaching at a point where their seeds require a pass through a bird's digestive system to help them prepare for germination.

Interactions and interdependence of birds and plants are specific for specific habitat. In Indian scenario, many examples and explanations have been documented by many authors but in publication, a few have been found. Many plants show a variety of life style in different habitats, similarly in the community of avifauna a variety of food and habits have been recorded on such life styles of plants. Round the year birds use different fruits, flowers, leaves, twigs, barks and many more different parts of plants. Seasonally available fruits, seeds, etc. are the attraction for different frugivorous birds though they use other food materials (Fig. 1, 2). Therefore there is a scope to study the interdependence of plants, medicinal plants, birds, insects, reptile and many more with intensive observations. Remembering the theme in mind the present study has been taken in to account for avifauna research in ecologically sound environment. Hope that it will

grow interest for many enthusiastic readers to start their own domain research in near future even those who are common birder working in an interdisciplinary field of research.

II. STUDY AREA

Study area includes open field of District Correctional Home, Midnapore, Town periphery, Kansai river basin, Gopegarh, Bhadutala, Salboni, Lalgargh, Jhargram, Binpur-II, Jamboni, Gopiballavpur, Sunderban (Jharkhali, Pakhirala, Dobanki, Gosaba etc.), Coastal Midnapore, Purulia, Bankura, Kayaler Bagan, Narendrapur, Kolkata under West Bengal. Round the year local premises were taken for details study about common birds and their interactions with special reference to medicinal plants.

III. MATERIALS AND METHODS

In the morning 5:30 am to 7:30 am and in the afternoon 4 pm to 5:30 pm was taken in to consideration for bird behaviour study. Photographs were taken, video recording done, sound recorded, movement and resting, roosting etc. were observed for common birds in the local area round the year followed 3 consecutive years since 2016. Common Bird Monitoring Programme (CBMP) was conducted at local area as per the instructions made by IBCN, Mumbai followed by Birdlife International. Field book, note book, diary, pen, pencil, camera, binocular, sound recorder etc. were used to record the data. Literature used for the same mentioned in the bibliography part¹⁻⁷. Sanctuaries and National parks visited time to time in a group to study the habit and habitats of birds. During entire study behaviours and use of medicinal plants by birds were recorded for further study.

IV. RESULTS AND DISCUSSION

Various data on different parameters were found on interactions on birds and medicinal plants. These are grouped in to various sub-disciplines.

IV.1 Tree Recovery by Birds:

Yellow footed Green Pigeon, commonly known as *hariyal* (*Treron phoenicoptera*)– The state Bird of Maharashtra, helps to disperse seeds of *Bridelia retusa* (Beng.-Gio) in forest and in woodland (Fig. 3). *Bridelia retusa* of Euphorbiaceae is a medicinal tree of the red lateritic deciduous forest found commonly in South Bengal and also in North Bengal which is sal (*Shorea robusta*). Other references record for the bird species associated with Figs and banyan trees.

IV.2 Birds and Pest Control:

Birds eat and control the parasites like insects and insect larvae which damage the parts of plants as well as medicinal plants. Research revealed that bluebirds control pests and parasites like blue green sharp shooters in California vine yards. The blue green sharp shooters insect not only damage the grapes but also spreads deadly diseases like grape blight which is commonly known as pierce disease.

IV.3 Use of Medicinal Plants and Birds:

Birds use different parts of medicinal plants in their nests to protect their eggs and chicks from parasites and insects like blood sucking fleas etc. Some birds choose insect repellent resins like pine boughs for nest construction (Bonelli's eagle). Corsican blue tits use aromatic plant materials like lavender, mint and aster etc. for nesting.

IV.4 Indian Grey Hornbills:

Indian Grey Hornbills (Fig. 5) and rock pigeons use dry barks, rachis and leaves of medicinal plants such as margosa (*Azadirachta indica*) in their nests as insect repellent (Table 1).

IV.5 Open bill storks and fresh twigs, fresh leaves of trees.

Common Mynas use leaves of many plants including leaves of *Vanda roxburghii*. Open bill use green twigs of Eucalyptus sp. and keep them in their nests.

IV.6 Bulbuls and Chestnut tailed Starlings:

Red-vented bulbul, red-whiskered bulbul including chestnut tailed (Fig. 4) starling use various plants like *Coccinia cordifolia*, *Cassytha filiformis* (Fig. 6) and fruits of *Odina wodier*. They use Damselflies as and when required instead of fruits which is very interesting (Fig. 2,4).

Table 1. Medicinal Plants used by human beings as well as by birds over the world

Sl. No.	Name of the Plants	Family	Parts Used	Medicinal Value	Bird's Use
1	Margosa/ Neem	Meliaceae	Bark, leaves, seeds	Wound healing	Insect repellent
2	Indian ash tree/ Jiyal	Anacardiaceae	Bark, fruits	Swellings	Termite resistant, food
3	Maharukh	Simaroubaceae	Leaf, bark	Anthelmintic	Anthelmintic
4	Satamuli	Asparagaceae	Root, fruits	Stomach pain	Food
5	Lavender	Lamiaceae	Leaf	Antiseptic	Antiseptic, aromatic
6	Mint /Pudina	Lamiaceae	Leaf, stem	Indigestion, bile secretion	Antiseptic, aromatic
7	Aster	Asteraceae	Flower, root	Reduce fever	Antiseptic, aromatic
8	Rasna/Alokelata	Orchidaceae	Root, leaf	Rheumatism	Nesting
9	Amaranth	Amaranthaceae	Root, leaf	High cholesterol	Food
10	Goosefoot	Amaranthaceae	Leaf, young shoot	Bug bites, sun strokes etc.	Food
11	Mahul	Sapotaceae	Flowers, Fruits	Insect repellent	Food
12	Eucalyptus	Myrtaceae	Leave	Asthma, head lice	Nesting
13	Still tree	Apocynaceae	Root	Treats Insect bites	Food
14	Love vine	Lauraceae	Seeds	Febrifuge, anodynic property	Fruit
15	Indian Elm	Ulmaceae	Fruit, seed	Diabetes, vomiting	Bark, seed
16	Ivy gourd	Cucurbitaceae	Fruit	Diabetes	Food
17	Banyan Tree	Moraceae	Fruits	Ulcer, fever	Food



Fig. 1 Red-whiskered Bulbul a frugivorous bird rarely eats Damselfly as an insectivorous bird (Photo by-Dr. D. Das, 2019)



Fig. 2 Frugivorous bird uses *Odina wodier* fruits during April, 2019 at Midnapore., W.B. (Photo-Dr. D. Das, 2019, Midnapore, W.B.)



Fig. 3 Yellow footed Green Pigeon on *Madhuca indica* tree (Photo by- Dr. D. Das, 2019, Midnapore, W.B.)



Fig. 4 Chestnut tailed Starling eating fruits (Photo by-Dr. D. Das, 2019, Midnapore)



Fig. 5 Malabar Grey Horn bill- a frugivorous bird eating Papaya fruits in Sanctuary. (Photo by- A. A. Das, 2018, Salim Ali bird Sanctuary, Kerala)



Fig. 6 Fruits of *Cassytha filiformis* (Cassythaceae) in wild used by Red-Vented Bulbul

V. CONCLUSION

1. In an ecosystem, birds are important not only as pollinator, cleaner of the environment, indicator of the healthy environment, pest controller but also improver of the quantity and quality of production of plants including medicinal plants.
2. They help to disperse the seeds of important medicinal plants in wild habitats, recover trees in forests and other herbaceous medicinal plants.
3. It is important to conserve birds in their own habitat to protect and improve the quality of the environment.
4. Article 51-A(g) of Indian Constitution, says that “It shall be duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers, and wildlife and to have compassion for living creatures”.
5. So, our conclusion is that, protect the bio-diversity, protect them and save them not by mercy but by our humanity to make a whole vivid environment for all.

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