

Study of types and patterns of bird feathers in Plain Prinia

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Abstract:

Birds are the only animals that have feathers and they come in many sizes, colours, and shapes. Feathers are the vital structure of the outer covering and flight surface of all modern birds. This study is to explore the types and patterns of feathers in Plain Prinia bird, focusing on their structure, types and functions.

In this preliminary study morphology, identification of feather types and patterns of plain Prinia are integral to its biology, behaviour, and survival.

On the basis of study feathers are classified into six types – down feathers, flight feathers, counter feathers, filoplumes feathers, and coverts feathers and bristle feathers. Pattern of feathers plays a vital role in understanding bird biology and ecology. Pattern of feather analysis refers to the process of identifying and analysing specific patterns, textures, and markings on bird feathers. These patterns are often visually complex and can involve features like spots, stripes, or shapes. The aim of the current study is the document may use as a key/tool for identifying birds based on the plumage parameters.

Keywords: Feathers, Types, Birds, Functions, Patterns, Morphology, Plain Prinia.

Introduction:

The **Plain Prinia** (*Prinia inornata*), a small passerine bird has a variety of feather types and patterns that are integral to its biology, behaviour, and survival. The plain Prinia (*Prinia inornata*), also known as the plain wren-warbler or white-browed wren-warbler, The study of feathers typically focuses on aspects such as structure, function, and coloration, each of these characteristics plays an essential role in the bird's ecological niche.

Feathers are one of the defining characteristics of birds, providing not only vital functions for survival but also remarkable diversity across species. This study is to explore the types and patterns of feathers in Plain Prinia bird, focusing on their structure, types and functions. By analysing various feather types, patterns, and functions. This study offers insights into the remarkable evolution of avian species and emphasizes the importance of feathers in understanding avian biology.

Feathers are the vital structure of the outer covering and flight surface of all modern birds.

Material and Method:

In this research we study the Plain Prinia bird for Study of types and patterns of bird feathers. The study was conducted in the grasslands and agricultural areas of where the Plain Prinia is commonly found. We collect the species randomly. This species is killed in road accident. We

collect the scattered feathers. Feathers were categorized based on their location on the bird's body (body feathers, wing feathers, tail feathers), and their physical characteristics were analysed under a microscope for detailed structural analysis. Take the photographs and note down it carefully and identified it with eBird and feather library.

Observation and Discussion

Types of feathers for the study include wing contour, body contour and Semiplume and tail plumages of Plain Prinia bird. Feathers can provide valuable information about species identification.

The Plain Prinia, have several types of feathers

Contour feathers:

These feathers cover the body, wings, and tail of the bird, providing a streamlined appearance and aiding in flight. These feathers are the most visible and cover most of the body. They have a smooth and sleek texture, contributing to the bird's overall shape.

The contour feathers are typically brownish, with subtle darker streaks. These streaks help the bird blend in with grassy habitats, offering some camouflage. The body feathers are lighter in colour (pale brown or grey), and the wings often show darker streaks or barring patterns.

The Plain Prinia, the contour feathers are relatively short and often dull brownish in colour with darker streaks. The length of the contour feather is 2.3 cm and width is 1 cm.

The pattern of the contour feathers is relatively simple, with muted tones and subtle markings that make the Plain Prinia well-suited to blending in with its natural surroundings.

Identification of feathers that is smooth and closely fitted to the bird's body, with a well-defined, narrow structure. These feathers typically have barbs and barbules that interlock, giving them a firm and aerodynamic shape.

Down feathers:

These feathers are found beneath the contour feathers. They are soft and fluffy, without a firm rachis which helps the bird maintain body temperature. The Plain Prinia has down feathers under its wings and around the chest. These feathers are smaller, lighter, and more delicate.

They tend to be pale and muted, often white or light brown. The length of the Down feather is 0.9 cm and width is 0.5 cm.

Down feathers are primarily used for insulation, so they don't display the streaked, barred, or patterned designs.

Identification of down feathers is softer and lacks the structure of contour and flight feathers. They are usually shorter and finer in texture.

Flight feathers:

These are specialized contour feathers found on the wings and tail that help with flight. The Plain Prinia is a non-migratory species; the flight feathers are adapted for short, rapid flights.

The flight feathers are longer and more rigid compared to the contour feathers. They are stiff and have a broader, flattened structure to aid in flight.

The *Plain Prinia*, flight feathers are typically darker than the rest of the body feathers, ranging from brown to dark brown, sometimes with lighter tips. The tail feathers also display darker tones, helping with balance and control during flight.

The length of the primary wing feather is 5 cm and width is 0.8 cm. The length of secondary wing feather is 3.8 cm to 4 cm and width is 0.7 cm to 0.8 cm. The length of greater primary covert is 2 cm and width is 0.6 cm. The length of greater secondary covert is 1.5 cm and width is 0.6 cm. The length of median covert is 1.5 cm and width is 0.4 cm. The length of lesser covert is 0.6 cm and width is 0.6 cm.

The central shafts of the flight feathers are usually darker and more rigid, ensuring the feathers maintain their shape during flight. The rachis (central shaft) may be slightly lighter.

Identification of Flight feathers is distinguished by their width and stiffness. The primary feathers (on the wing tips) are longer and have sharp, pointed tips, while secondary feathers (closer to the body) are shorter and broader.

Tail feathers:

The tail is long. Tail feathers are relatively long and pointed, with distinct edges that help with steering and balance during flight. The tail feathers of the *Plain Prinia* often have subtle dark barring, with a slightly darker tone than the body contour feathers. The length of tail feather is 5 cm. and width is 0.7 cm.

The tail feathers of the *Plain Prinia* may exhibit dark barring or faint streaking, especially near the tips of the feathers. These markings create a subtle but effective pattern.

Identification of Tail feathers is typically more elongated than other feathers, and they are characterized by their sharp, stiff edges. There may be slight notching or barring visible on the feathers.

Semiplumes:

These are intermediate feathers, found beneath the contour feathers, Found underneath the visible contour feathers around the bird's underparts, mostly around the belly and chest.

Have a fluffy down-like base and a more defined rachis.

The colour of the semiplume feathers are typically in a lighter shade, ranging from pale brown to cream or off-white. The length of semiplume feather is 1 cm. and width is 0.5 cm.

Semiplume feathers don't usually have any defined patterns, such as streaking or barring.

Identification of semiplume feather is soft and fluffy with a central shaft and barbed branches.

Filoplumes:

Filoplumes are thin and fine feathers with a long, slender shaft and short barbs at the tip. Filoplumes are typically located near the base of the contour feathers, including on the wings, tail. These hair-like feathers are associated with sensory functions, providing feedback on the movement of the larger feathers during flight. The length of Filoplume feather is 1.3 cm and width is 0.5 cm. Filoplumes generally lack any markings or patterns.

The body feathers are

Crown and Head:

The Plain Prinia typically has a muted, greyish or brownish crown, with little contrast between the head and body. This coloration may have subtle darker streaks. The length of upper neck / head region of feather are 0.9 cm. and width is 0.5 cm.

Lower neck region:

The feathers in this region are shorter and relatively smooth. The lower neck region of the Plain Prinia is typically light brown or pale beige in colour. The length of the feather is 1 cm. and width is 0.5 cm.

Upper body feather / contour feather:

Contour feathers are often a bit longer, rigid **and** streamlined, with a central shaft and closely aligned barbs. The **colour** is darker shades **of** brown or olive-brown. The length of contour feather is 2.3 cm. and width is 1 cm.

Lower body feather:

The **feathers** on the lower body are softer and fluffier, belly, flanks, **and** underparts. These feathers are typically pale beige, cream, **or** light brown, which contrasts with the darker brownish or olive-brown tones of the upper body. The length of lower body feather is varies from 0.2 cm. to 0.5 cm. and width is varies from 0.1 cm. to 0.2 cm.

Thigh feather:

The feathers are soft and fluffy, providing insulation and some flexibility. The colour of feather is typically light brown, cream, or beige. The feathers are generally plain, with minimal streaking or barring. The feather is short and smooth. The length of thigh feather is 0.2 cm. and width is 0.1 cm.

Each type of feather serves a specialized function that aids in a bird's survival, flight, mating rituals, and communication. Whether it's the soft down feathers that keep a bird warm, the colourful contour feathers used for display, or the flight feathers that allow birds to soar through the sky, these adaptations are a result of millions of years of evolution. Studying the various feather types provides valuable insight into the biology and behaviour of birds.

The aim of the current study is the work might be helpful in various fields such as forensic investigation, illegal wildlife trades; where this document may use as a key/tool for identifying birds based on the plumage parameters.



Upper Part of Wing



Lower Part of Wing



Contour Feather



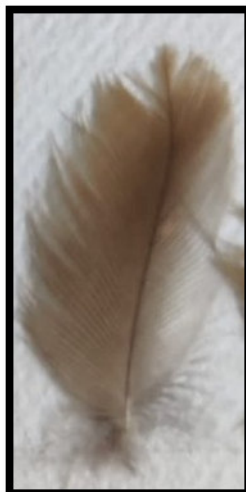
Down Feather



Primary Wing Feather



Secondary Wing Feather



Greater Primary Covert



Greater Secondary Covert



Lessor Covert



Mediun Covert

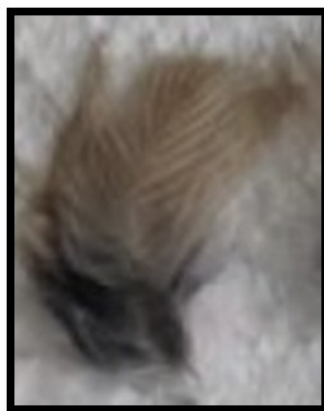


Tail Feather

Types of Feathers



Upper Neck Feather



Lower Neck Feather



Thigh Feather



Upper Body Feather

Dorsal Side



Lower Body Feather

Ventral Side

Types of Body Feathers

The study of feather types and patterns in the Plain Prinia provides valuable insights into the role of plumage in avian adaptation. The bird's feathers serve multiple functions, from flight support to thermoregulation and camouflage. The cryptic coloration is particularly significant in reducing predation risk in open fields and grasslands, where cover is minimal.

The presence of specialized flight feathers indicates the importance of flight in foraging and escaping predators, while the down feathers play a critical role in maintaining energy efficiency by preventing heat loss.

This study highlights the diverse and adaptive roles of feathers in the Plain Prinia. From camouflage to flight, the bird's plumage is an essential part of its survival strategy.

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