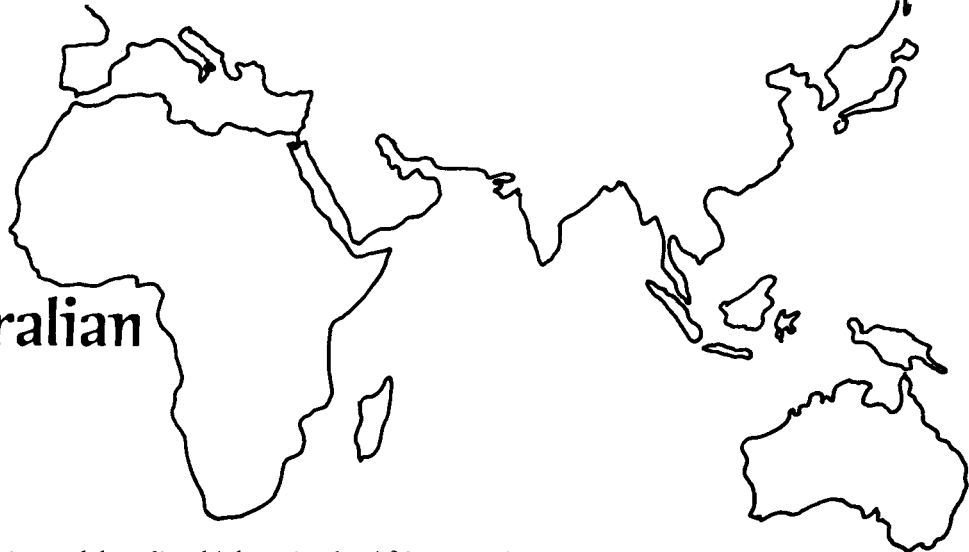


A Comparison Of African And Australian Grass Finches

By Klaus Immelmann



INTRODUCTION

The Weaver-Finches, or Grass Finches are a group of small, seed-eating Passeres being distributed over most of Africa, Southern Asia, and the Australian region. For some time, they have been considered a subfamily (Estrildinae) of the true Weavers (Ploceidae) (cf Delacour 1943, Morris 1958 a.o.). Because, however, of great differences in anatomy, physiology, and behavior most recent workers are of the opinion that the Grass Finches constitute a separate family, the Estrildidae or Spermestidae (Beecher 1953; Steiner 1955, 1960; Wolters 1957; Immelmann 1962 a.o.).

In Africa and Australia (the Asiatic species are far less known), Grass Finches show an extensive adaptive radiation within different vegetation zones: they inhabit dense rain-forest, open sclerophyll forest, open savanna country, grassland, and even semi-desert country. From various morphological characters (ptyerylosis, mouth-markings, transverse barring of the feathers, cf. Steiner 1960, Harrison 1962) it seems to be clear that the most primitive species (genus *Clytospiza*⁴, *Hypargos*, and—partly—*Estrilda* in Africa, genus *Zonaeginthus* and *Aegintha* in Australia) inhabit an intermediate type of vegetation (open sclerophyll forest or savanna woodland). From there the group has penetrated several times independently both into dense forest (genus *Cryptospiza*, *Spermophaga*, *Nigrita*, and *Parmoptila* in Africa; *Zonaeginthus ocellatus* in Australia) and into open grasslands, scrub, and semi-desert country (most species of the genus *Estrilda*, *Lagonosticta*, *Amadina*, *Pytilia*, *Granatina*, and *Uraeginthus* in Africa; majority of Australian Grass Finches).

Between densely vegetated and arid, open areas there exist differences in various environmental factors such as food supply and spatial distribution of food, seasonal distribution of food, predation pressure, supply of nest-sites and nesting material. These differences have led to very marked parallel adaptations in be-

havior and breeding biology in the African and Australian species of Grass Finches which shall be described below.

My conclusions are based on field observations on all species of Australian Grass Finches during a one year's stay in Australia as well as on extensive observations of many species of African and Australian Grass Finches in captivity.

I. FOOD SUPPLY

(1) In dense vegetation, there is a constant, but possibly rather poor supply of buds, fruits, and seeds of various plants as well as of tree-living insects and other small animals. The food is almost evenly distributed. Food supply tends to be fairly constant throughout the year.

(2) In typical dry country, such as savannas, open grasslands, or semi-desert country, on the other hand, ground cover consists mainly of grasses which sometimes belong to a very few or merely to a single species. Food sources are extremely irregular in their seasonal and spatial distribution: Half-ripe seeds and insects (swarming ants and termites) are available only during the wet season(s) while during the rest of the year, only dry seeds are available. At all seasons, food is abundant at some places (e.g. near lakes, rivers, and waterholes) but may remain scarce at others.

As a consequence of different food sources the following differences in behavior and morphology may be noted:

II. FEEDING HABITS

(1) In dense vegetation zones, Grass Finches tend to feed on a mixed diet of seeds, fruits, buds, and small insects, spiders, and snails. While feeding, the birds forage in bushes, trees and scrub, sometimes clinging to the twigs in a most acrobatic manner. They are able to use their feet for holding flower stems when picking at the seed-heads. Insects and other small animals are also picked from the foliage, and the birds are seldom seen on the ground (examples: Australia: *Zonaeginthus ocellatus*, Immelmann 1950; Africa: *Nesocharis ansorgei*, R. Chapin

1959).

(2) In open country, Grass Finches feed almost entirely on grass seeds. It is mainly during the wet season that insects may be taken additionally, especially for rearing young. Usually the food is taken from the ground. The birds pick up grass seeds from the soil or pull them directly from the stalks with a characteristic head-shaking movement. The most typical ground feeders (e.g. *Poephila* and *Taeniopygia* in Australia, Immelmann 1962; *Lagonosticta* and *Uraeginthus* in Africa, Harrison 1956, 1962, Kunkel 1959, Goodwin 1964) are not able to hold food with their feet. Insects are also taken from the ground or caught in flight.

III. BILL SIZE AND SHAPE

Bill size and shape is strongly correlated with the food taken. Grass Finches feeding on a mixed diet tend to have small, pointed bills. Typical open country species which feed on big and fairly hard grass-seeds, on the other hand, possess rather big, heavy bills. Differences in bill size corresponding with different food sources are known even between the races of a single species (*Pirenestes sanguineus*, Chapin 1954).

Two exceptions to this rule are known, being adaptations to special food sources. In Africa, the *Spermophaga* species inhabit dense vegetation but possess fairly big bills. They seem to take buds and berries to a large extent and may use their bills as a fruit press. The Australian *Emblema picta* lives in extremely arid country but possesses a slender, pointed bill, which is used like a pair of tweezers to pick single seeds from sandy soil.

It will be clear from the foregoing that bill size and shape in Grass Finches (as in other birds) is highly adaptive and depends mainly on the quality of the food taken. According to this, it may vary within closely related species, and therefore, should not be used as a systematic character, as has been done in former times (for discussion see Wolters 1939; Delacour 1943; Harrison 1962).

To be continued in Next Issue.