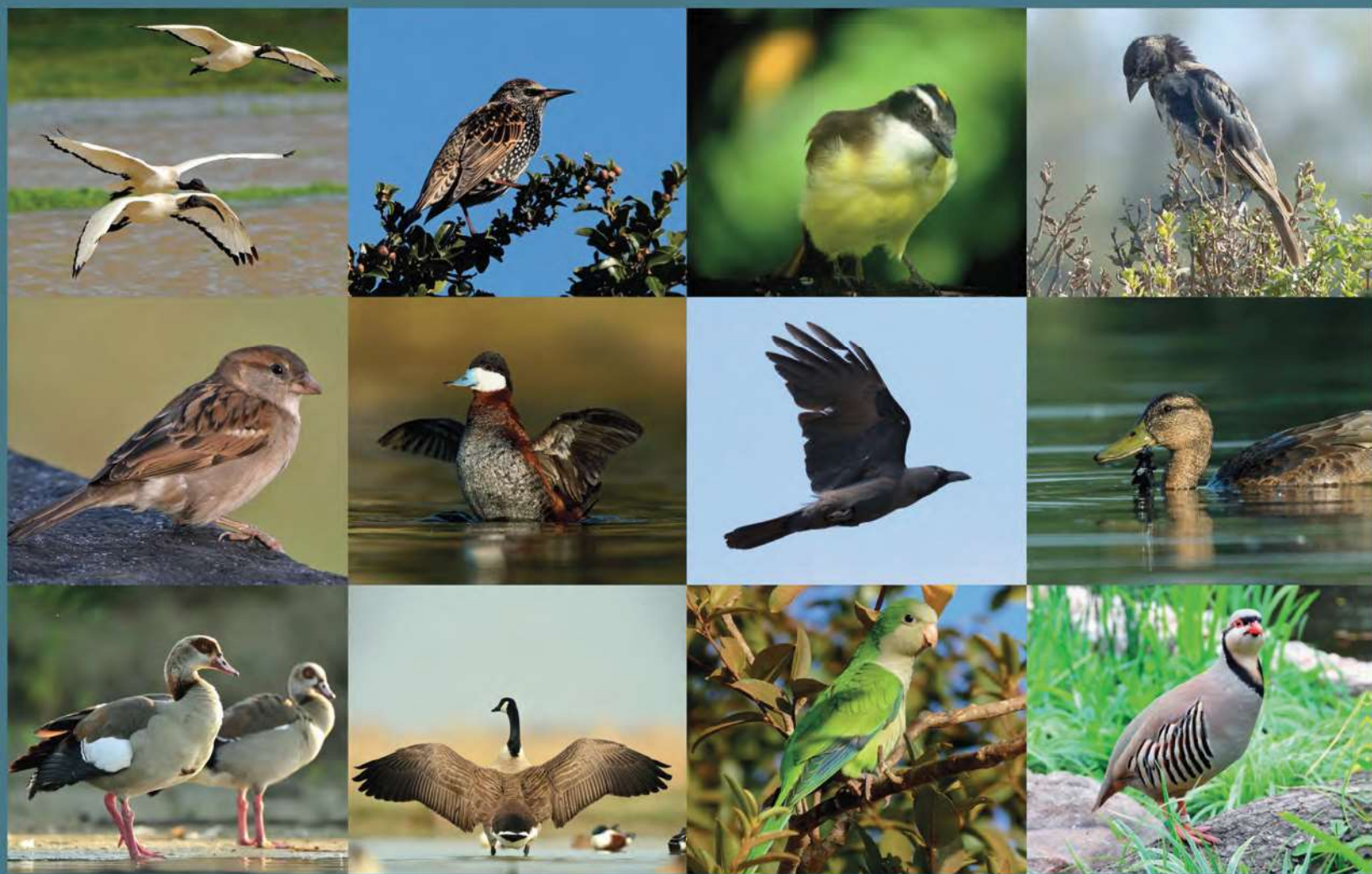


Invasive Birds

Global Trends and Impacts

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21 Scaly-breasted Munia (*Lonchura punctulata* Linnaeus 1758)

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- *L. p. cabanisi*: the Philippines (Luzon, Mindoro, Panay, Cebu, Calauit and Palawan).
- *L. p. particeps*: Sulawesi.
- *L. p. sumbae*: Sumba (Lesser Sundas).
- *L. p. blasii*: Flores, Timor, Tanimbar Islands and adjacent Lesser Sundas.

21.1 Common Names

Nutmeg Finch, Nutmeg Mannikin, Nutmeg Munia, Ricebird, Scaly-breasted Manakin, Scaly-breasted Munia, Spice Finch, Spice Munia, Spotted Mannikin, Spotted Munia.

The Scaly-breasted Munia has also been introduced to Mauritius, Réunion, French Polynesia, Guadeloupe, Hispaniola, Hawaii, Australia, Japan, Puerto Rico, Cuba, United Arab Emirates, Portugal, Yucatán Peninsula, Cayman Islands and the USA (California, Texas, Florida and Mississippi; Fig. 21.1) (BirdLife International, 2019).

21.2 Distribution

There have been 12 subspecies of the Scaly-breasted Munia (*Lonchura punctulata* Linnaeus 1758) described that are native to northern Pakistan, India, southeast Asia, and the multiple islands and archipelagos of the region, including the Philippines, Polynesia, Thailand and Sri Lanka (Fig. 21.1). Specific distributions of the subspecies are as follows (Lepage *et al.*, 2014):

- *L. p. punctulata*: Nepal to Sikkim, India and Sri Lanka.
- *L. p. nisoria*: Java, Bali, Lombok and Sumbawa.
- *L. p. holmesii*: south-east Borneo (Kalimantan).
- *L. p. fretensis*: southern Thailand and Malay Peninsula to Sumatra and adjacent islands.
- *L. p. baweana*: Bawean Island.
- *L. p. subundulata*: north-east India (Assam) to Bhutan and western Myanmar.
- *L. p. topela*: southern China to northern Thailand, Indochina, Hainan and Taiwan.
- *L. p. yunnanensis*: north-east Myanmar and south-west China.

21.3 Description

The Scaly-breasted Munia is about 12 cm long and weighs 12–16 g (Payne, 2010). Adult birds have a dark brown head with lighter brown wings, tail and back (Fig. 21.2). The contour feathers on the breast and underside of adult birds are whitish grey with brown edging, creating a scalloping pattern on the underside of the bird. The undertail coverts do not have this pattern and appear whitish grey. Feathers on the head, back and wings have barely noticeable barring and pale shaft streaks (Payne, 2010). On the tail, the central rectrices have a golden tinge (Payne, 2010). The bills are blackish with a paler blueish grey at the base of the lower mandible. The only differences between the sexes are darker markings on the underside and a darker throat in males (Rasmussen and Anderton, 2005). However, there can be variations in plumage colour and size across the different populations in their native range (Payne, 2010).

Juveniles are lighter in colour having uniform pale-brown upperparts and lacking the dark head found in adults. Scaly-breasted Munia juveniles can often be confused with juveniles

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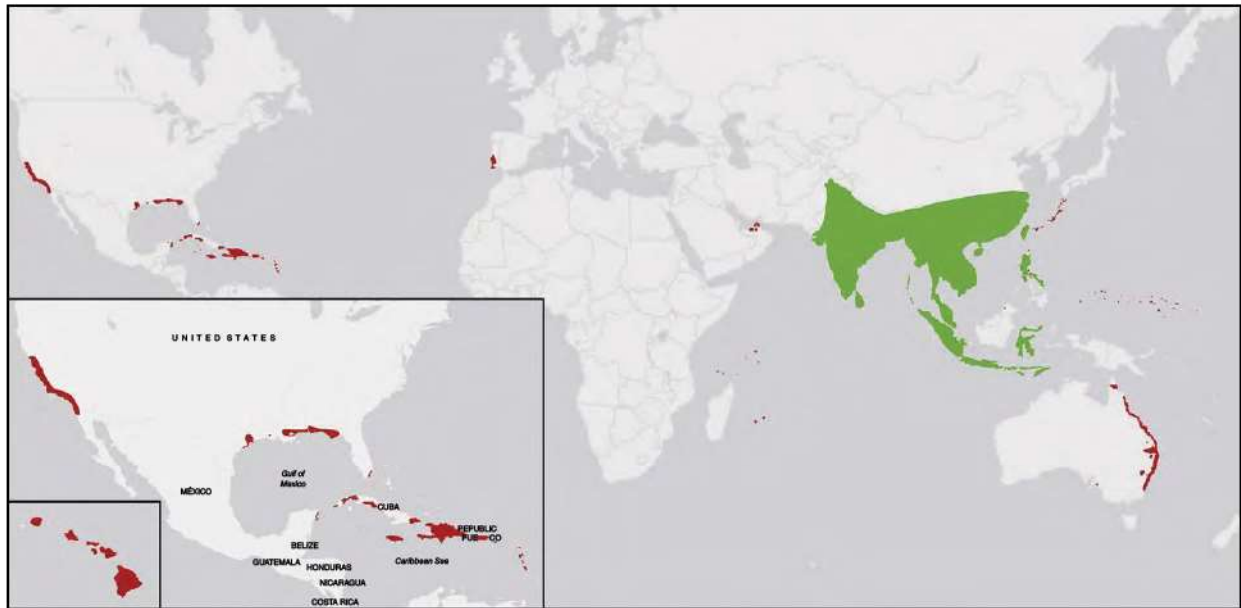


Fig. 21.1. Global distribution of the Scaly-breasted Munia (*Lonchura punctulata*) showing the native (green) and introduced (red) ranges; the inset shows North America. (Data from Sullivan *et al.*, 2009; Dyer *et al.*, 2017; Birdlife International, 2019).



Fig. 21.2. An adult Scaly-breasted Munia. (©Photograph: Doug Fincher.)

of other munia species such as the Tricolored Munia (*Lonchura malacca*) and Black-throated Munia (*Lonchura kelaarti*) (Restall, 1997; Rasmussen and Anderton, 2005).

The Scaly-breasted Munia song starts with repeated quiet notes followed by a series of whistles and churrs and ending with a slurred, longer 'weee'. They have two different contact calls. One contact call is a softer repeated 'tit-ti, tit-ti', while the other is a louder 'kit-tee, kit-tee'. The louder call is disyllabic, with the tone differing between sexes. The flight call is a rising 'puip' or 'siew', often heard in flocks (song characteristics adapted from Payne, 2010).

21.4 Diet

The Scaly-breasted Munia feeds mainly on seeds from grasses, crops and casuarinas (Ali and Ripley, 1987). Like some other munias, they may also feed on filamentous algae in shallow water (Wells, 2007; Payne 2010). In addition, Scaly-breasted Munias have been observed eating fleshy fruit such as those of *Lantana* spp. (Payne, 2010). Some insects and household scraps are also taken for food (Payne, 2010).

Invasive populations of Scaly-breasted Munias in Texas consume a variety of grass seeds but are common at feeders in urban areas, comprising 67% of all foraging observations in that region (Conn *et al.*, 2017).

21.5 Introduction and Invasion Pathways

Scaly-breasted Munias are a common cage bird and are used for religious ceremonies. It is thought that the introduced populations in the USA (California, Texas and Florida) were the result of escaped pets or were released intentionally as a part of ceremonies and rituals (Garrett and Garrett, 2016; Conn *et al.*, 2017). In Hawaii, the birds seem to have been introduced by M. Hillebrand in 1866 after an expedition to Asia (Meier, 2005; Pyle and Pyle, 2017). After the initial introduction to Honolulu, it is believed that they then dispersed throughout the other islands from this initial introduced population, as flocks have been observed at sea (Pyle and Pyle, 2017). It is thought that the ecological plasticity of the Scaly-breasted Munia is why it is so successful throughout its introduced range. In addition, the frequency at feeders in urban areas could be another reason why they are so widespread.

21.6 Breeding Behaviour

Scaly-breasted Munia breeding occurs throughout the year, with peaks during various months depending on the region. In India breeding occurs mainly in May–September, in Singapore they breed from February to September; in Borneo and Flores from March to July, and in Timor from May to June. In the Malay Peninsula, breeding occurs in all months except November, with the last brood usually fledging in October. Breeding occurs in almost all months in the Philippines, Thailand and Indonesia (breeding periods adapted from Voous, 1950; Payne, 2010).

Scaly-breasted Munia males attract females by holding grass in the bill and carrying it around (Payne, 2010). The male drops the grass when singing, during which he pivots his body and swings his head from side to side (Payne, 2010). The male then perches upright, fluffs its feathers and bobs, stretching and bending its legs (Payne, 2010).

In India, the Scaly-breasted Munia is known to nest in grass averaging 2.23 ± 0.64 m from the ground (Gokula, 2001). However, nests are rarely found below 4 m and can be found at up to 13 m concealed in trees, ferns, palms, creepers and epiphytes including orchids (Payne, 2010). Their nests are loosely constructed balls made of grass heads, strips of leaves and twigs, with a lower opening on the side (Payne, 2010), constructed by weaving the grass and leaves together. Inside, the nests are lined with fine grass. One nest in India took 6 days to finish and for egg-laying to initiate (Lamba, 1974). Occasionally, old nests are used. Nests are often in colonial groups but can also be solitary in some areas. When nests are found in colonies, there can be ten or more nests in a single tree (Payne, 2010).

Clutches of three to six eggs are laid and incubated for 14–15 days (Gokula, 2001; Payne, 2010). After hatching, the nestlings stay in the nest for 18–19 days (Payne, 2010). There have been clutches larger than six, but these are thought to be due to multiple females laying eggs in a single nest. Multiple females laying in the same nest has been observed in the Malay Peninsula. In addition, some nests can contain young of various ages, providing support for the notion that multiple females can use the same nest. Up to five young can fledge from a single nest (Payne, 2010). Scaly-breasted Munias can have up to four clutches per season but usually have two (Restall, 1997; Smithson, 1997).

In the introduced range, less is known about the breeding behaviour of Scaly-breasted Munias. In Hispaniola, breeding was from June to October (Payne, 2010), in Texas it was from April to September (Conn *et al.*, 2017), and in California it was from February to November (Smithson, 1997). In California, nests are most commonly found in introduced pines at an average height of 5.6 m, and in Texas nests are found in various plant species 1.8–4.0 m from the ground (Conn *et al.*, 2017).

In California, Scaly-breasted Munias are hosts for the introduced nest parasite the Pin-tailed Whydah (*Vidua macroura*), and researchers believe that the spread of the Pin-tailed Whydah is directly related to the occurrence of Scaly-breasted Munia (Garrett and Garrett, 2016). Additionally, there is a record of parasitism of a Scaly-breasted Munia nest by a Shiny Cowbird (*Molothrus bonariensis*) in Puerto Rico (Pérez-Rivera, 1986).

21.7 Habitat

Scaly-breasted Munias are found in a range of habitats including grasslands with bushes, trees and scrub. They can also be found in scrubby mangroves, coastal landfill and anthropogenic habitats such as gardens and cultivated lands (Payne, 2010). In India, they are especially common in paddy fields where they are considered a minor pest due to their feeding on grain. While they are found mainly in the plains, they are also in the foothills of the Himalayas and can be seen at altitudes up to 2500 m above sea level (a.s.l.). On the Myanmar–Chinese border, they have been observed at up to 3000 m a.s.l. (Payne, 2010). Typically, they are found close to water and grassy habitats. For instance, in Pakistan, they can only be found from Swat in the west to Lahore but are absent from the desert regions (Abbass *et al.*, 2010).

Outside their native range, Scaly-breasted Munias occupy habitats that have similar characteristics to their native range, with only a few areas such as south-eastern Australia and the Persian Gulf exhibiting habitats that are less like that of the native range (Stiels *et al.*, 2015). In Texas, they prefer weedy fields and detention ponds, and are commonly found in residential gardens; more than half of all observations were in large parks (Brooks and Page, 2012; Conn *et al.*, 2017). In Hawaii, they are most commonly found in lowland fields, open woodlands and parks. In addition, on the island of Oahu, they are more commonly observed in lowland forest with sparse canopies than intact forests (J.M. Gleditsch *et al.*, unpublished data). Records indicate that they have been found at up to 2500 m a.s.l. on Mauna Kea and are only occasionally found in openings to native forest (Pyle and Pyle, 2017). In Japan, they are found in riparian reed bed habitats (Eguchi and Amano, 2004).

21.8 Impacts

In many areas, Scaly-breasted Munias are regarded as an agricultural pest, feeding in large flocks on cultivated cereals such as rice. In Australia, they are believed to be a competitor with native estrilids, but in other areas of the introduced range, competition with native species has not been observed or reported (Conn *et al.*, 2017). Additionally, there may be some concern about this species and the spread of parasites and diseases, given their abundance at feeders and their propensity to form mixed-species flocks. The first report of *Sternostoma tracheacolum*, a respiratory parasite, in Hawaii was found in other estrildid finches in an atypical locale (Smith, 1973). However, Scaly-breasted Munias are not susceptible to avian malaria (*Plasmodium relictum*) in Hawaii (Atkinson *et al.*, 1995), suggesting that this concern may be specific to disease and location.

21.9 Control

Trapping of Scaly-breasted Munias has occurred in many areas, including parts of their native range, to control their impact on agriculture. In 1934, tens of thousands were trapped to minimize their impact on rice production in Hawaii, with limited success (Bryan, 1937).

21.10 Uses

The Scaly-breasted Munia is a common bird used in Buddhist Feng Sheng ceremonies, making up 35% of birds sold in Phnom Penh, Cambodia (Gilbert *et al.*, 2012). Additionally, Scaly-breasted Munias are relatively inexpensive cage birds, making them popular in the pet bird trade, or are purchased for release during religious ceremonies (Conn *et al.*, 2017).

21.11 Notes

The Scaly-breasted Munia is a model species for foraging and physiological studies due to its flocking behaviour and the ease of keeping them in captivity. Most notably they were used by Giraldeau *et al.* (1994) to test the producer–scrounger game, and later by others for understanding mixed–species flocks (e.g. Beauchamp and Livoreil, 1997; Giraldeau and Beauchamp, 1999; Rieucan and Giraldeau, 2008).

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