



The Auk

A Quarterly Journal
of Ornithology

Vol. 114 No. 1 January 1997

The Auk 114(1):1-10 + frontispiece, 1997

NEW AETHOPYGA SUNBIRDS (AVES: NECTARINIIDAE) FROM THE ISLAND OF MINDANAO, PHILIPPINES

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ABSTRACT.—We describe a new species of sunbird, *Aethopyga linaraborae*, known from Mt. Mayo, Mt. Puting Bato, and Mt. Pasion, all part of an isolated range of mountains in eastern Mindanao, Philippines. It occurs commonly in mossy forest from about 1,200 m and above. We also describe a new subspecies of Apo Sunbird, *Aethopyga boltoni tibolii*, known from Mt. Busa and Mt. Matutum of southern Mindanao, where it is found in mossy forest above 1,000 m. Received 23 April 1996, accepted 1 August 1996.

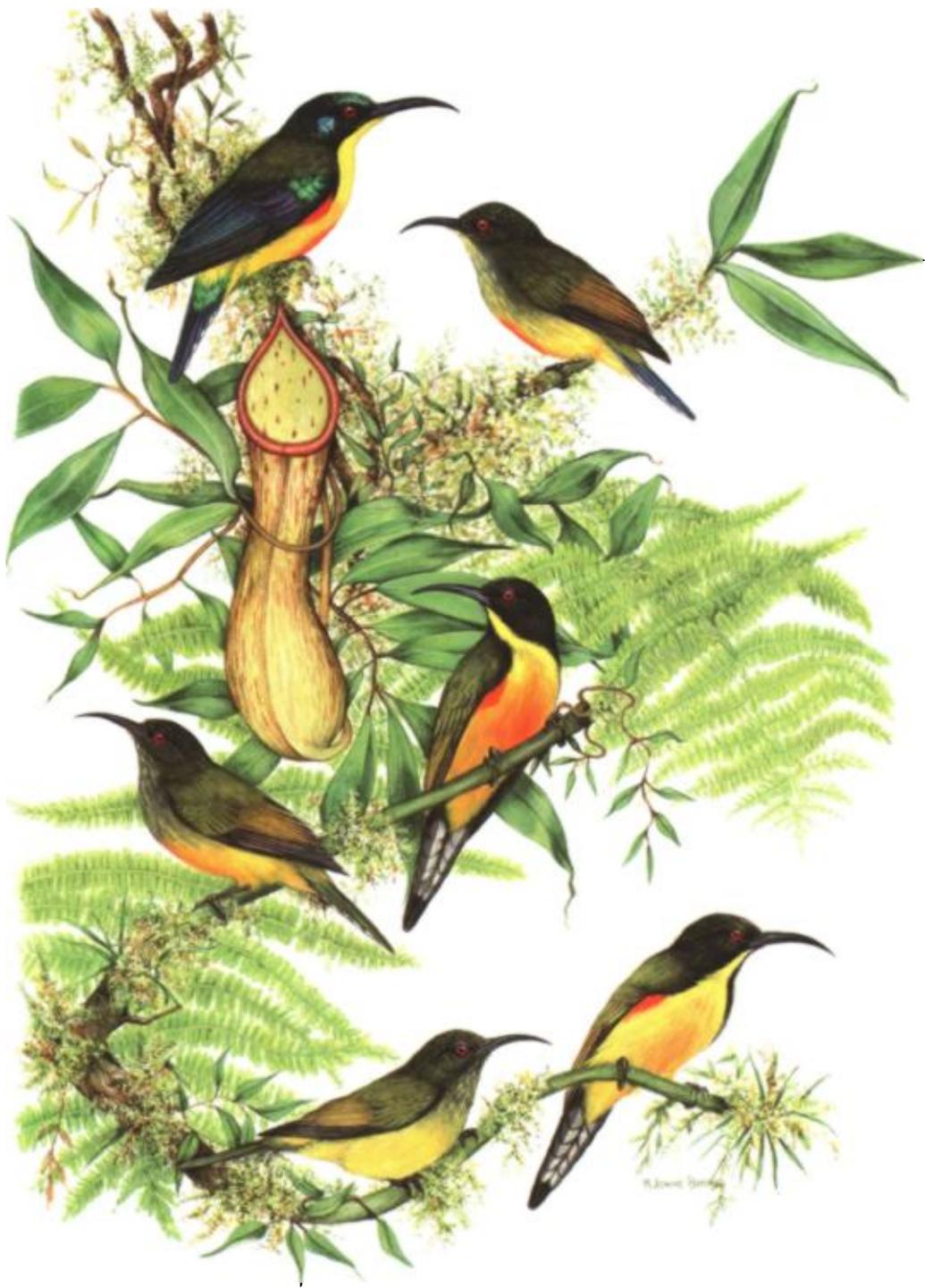
MINDANAO (97,923 km²) is the second largest of the more than 7,100 islands that comprise the Philippine Archipelago (see Fig. 1). Of the 341 species of birds that have been recorded from the island, 248 are residents, 89 are migrants or accidentals, and 4 have both resident and migrant populations. Among the residents, 20 are endemic to Mindanao and its adjacent land-bridge islands of Basilan, Dinagat, and Siargao; 75 are endemic to the Philippines; and 153 are more widely distributed (duPont 1971, Dickinson et al. 1991).

Dickinson et al. (1991) summarized the ornithological exploration of Mindanao that began in 1771 or 1772 when Sonnerat (1776) visited Zamboanga in western Mindanao. By the close of the 19th century, many lowland areas had been explored, yielding only five of the endemics, and a few naturalists had climbed Mindanao's highest peak, Mt. Apo (2,938 m), without obtaining any of its rich montane avifauna. However, most of Mindanao's endemic birds are mid-elevation or montane species, and

with but one exception, all were discovered within this century (Table 1).

In response to growing concern over deforestation and the status of the fauna of the archipelago, the National Museum of the Philippines (NMP) and Cincinnati's Museum of Natural History and Science (CMNH) initiated the Philippine Biodiversity Inventory (PBI) in 1989 to survey remaining forested areas. The PBI focused on sites that either were poorly known or never had been studied by naturalists. In 1993, the PBI team conducted surveys on three Mindanao mountains (see Fig. 1): Mt. Apo, Mt. Busa, and Mt. Puting Bato (the name used locally; on most maps it is Mt. Tagub).

Among the many important discoveries of the Mindanao surveys were specimens of what appeared to be two unique populations (one from Mt. Busa in southern Mindanao and one from Mt. Puting Bato in eastern Mindanao) of the Apo Sunbird (*Aethopyga boltoni*), a Mindanao endemic represented by the subspecies *A. b. boltoni* (Mearns 1905) and *A. b. malindangensis*



FRONTISPIECE. Adult male (upper left) and female (upper right) Lina's Sunbirds (*Aethopyga linaraborae* sp. nov.); adult male (center right) and female (center left) Apo Sunbirds (*Aethopyga boltoni boltoni*); and adult male (lower right) and female (lower left) Apo Sunbirds (*Aethopyga boltoni tibolii* subsp. nov.), all from the high mountain forests of Mindanao, Philippines. From a mixed media painting by Melinda Johns Bitting. Publication of this Frontispiece was supported by the Donald L. Bleitz Fund.

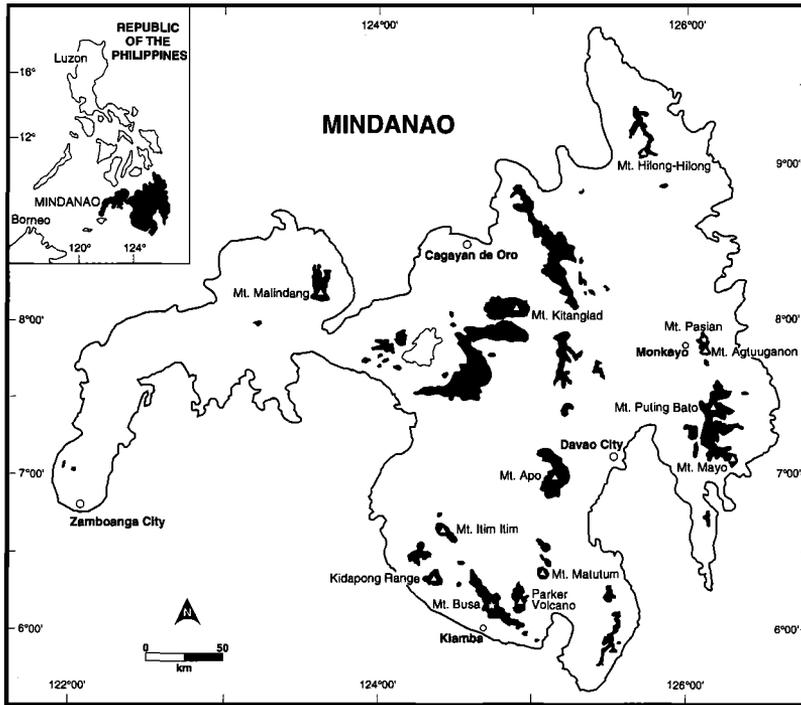


Fig. 1. Map of Mindanao, Philippines showing the holotype localities (stars) for *Aethopyga linaraborae* (Mt. Pasian) and *Aethopyga boltoni tibolii* (Mt. Busa), mountain peaks mentioned in the text (triangles), and the distribution of land above 1,200 m (filled black) on the island.

(Rand and Rabor 1957). Because the taxonomic outcome of these new populations differs, we will treat each separately. We are aware of recent debates over the "species concept" (Cracraft 1983, Zink and McKittrick 1995, Zink 1996) but have elected to follow the long-established tradition of recognizing species and subspecies based on levels of differences between populations (Mayr 1942, Amadon 1949). We also are aware of the problems with recent descriptions of species and thus adhere to the guidelines proposed by LeCroy and Vuilleumier (1992) for describing new species of birds.

NEW SUNBIRD FROM EASTERN MINDANAO

The PBI team conducted a survey on Mt. Puting Bato from 2 to 8 May 1993, covering elevations from 1,130 to 1,360 m. During the course of this survey, Jeff Brown and colleagues obtained eight specimens (skins with associated fluid-preserved bodies, two males and one female; whole fluid-preserved specimens, one male and four unsexed) identified in the field as the Apo Sunbird. Upon return to CMNH, we

carefully compared these specimens with those of the Apo Sunbird from Mt. Apo and concluded they were strikingly different. We also located previously unreported specimens (nine males and eight females) that were identical to the Mt. Puting Bato birds at the National Museum of Natural History (USNM) and the Field Museum of Natural History (FMNH). Dioscoro S. Rabor had collected them from 15 to 27 June 1965 on Mt. Mayo, a peak in the same range of mountains 40 km south-southeast of Mt. Puting Bato (Fig. 1). The name "*Aethopyga boltoni boltoni*" had been written on the tags, presumably by Rabor when he prepared the labels in the field.

In 1994, Kennedy and the PBI team attempted to continue the surveys of Mt. Puting Bato but were prevented from entering the region because of increased dissident activity. Instead, the team surveyed Mt. Pasian, 45 km north of Mt. Puting Bato and within the logging concession of PICOP Resources Inc. (formerly the Paper Industries Corporation of the Philippines). They sighted several individuals of the "new" sunbird and obtained four additional

TABLE 1. Montane birds endemic to Mindanao discovered since 1900.

Species	Location	Year	Source
Mindanao Lorikeet (<i>Trichoglossus johnstoniae</i>)	Mt. Apo	1903	Hartert 1903
Black-and-cinnamon Fantail (<i>Rhipidura nigrocinnamomea</i>)	Mt. Apo	1903	Hartert 1903
Apo Myna (<i>Basilornis miranda</i>)	Mt. Apo	1903	Hartert 1903
Black-masked White-eye (<i>Lophozosterops goodfellowi</i>)	Mt. Apo	1903	Hartert 1903
Cinnamon Ibon (<i>Hypocryptadius cinnamomeus</i>)	Mt. Apo	1903	Hartert 1903
Olive-capped Flowerpecker (<i>Dicaeum nigrilore</i>)	Mt. Apo	1903	Hartert 1904
Apo Sunbird (<i>Aethopyga boltoni</i>)*	Mt. Apo	1903	Mearns 1905
Bagobo Babbler (<i>Leonardina woodi</i>)	Mt. Apo	1904	Mearns 1905
Goodfellow's Jungle-Flycatcher (<i>Rhinomyias goodfellowi</i>)	Mt. Apo	1905	Ogilvie Grant 1905
McGregor's Cuckooshrike (<i>Coracina mcgregori</i>)	Mt. Malindang	1906	Mearns 1907
Grey-hooded Sunbird (<i>Aethopyga primigenius</i>)	Mt. Apo	1929	Hachisuka 1941
Cryptic Flycatcher (<i>Ficedula crypta</i>)	Mt. Apo	1946	Vaurie 1951
Red-eared Parrotfinch (<i>Erythrura coloria</i>)	Mt. Kitanglad	1960	Ripley and Rabor 1961
Mindanao Scops-Owl (<i>Otus mirus</i>)	Mt. Hilong-Hilong	1963	Ripley and Rabor 1968
Whiskered Flowerpecker (<i>Dicaeum proprium</i>)	Mt. Apo	1965	Ripley and Rabor 1966

* First specimen collected by Walter Goodfellow in 1903, but type collected by Edgar Mearns in 1904.

specimens (skins with fluid-preserved bodies and frozen tissue, three males and one female).

With all material assembled, and after further comparisons with all known populations of the Apo Sunbird, we concluded that the sunbird from the mountains of eastern Mindanao represents a new species and here describe it as

***Aethopyga linaraborae* sp. nov.**
Lina's Sunbird

Holotype.—National Museum of the Philippines No. 17801, adult male (with 100% cranial pneumatization and left testis measuring 7×4 mm), collected 22 May 1994 at an elevation of 1,200 m (ca. $7^{\circ}52'N$, $126^{\circ}12'E$), 2.2 km north and 1.0 km east of the peak (1,409 m) of Mt. Pasion in the Simulaw River Drainage, Municipality of Monkayo, Davao del Norte Province, Mindanao, Philippines by the National Museum of the Philippines/Cincinnati Museum of Natural History Philippine Biodiversity Inventory Team, field number Robert S. Kennedy 3273, prepared by Renato E. Fernandez.

Description of holotype.—See Frontispiece and Figure 2. Forehead metallic Emerald Green 163 (color names and numbers from Smithe 1975, 1981) with a hint of Cyanine Blue 74. Head Blackish Neutral Gray 82 with crown feathers finely edged with metallic Cyanine Blue. Back Olive-Green 47; clearly defined rump Sulfur Yellow 157; uppertail coverts deep metallic Emerald Green. Tail feathers dark Blackish Neutral Gray, edged with Spectrum Violet 72 with all but the central feathers having whitish silver

tips. Ear patch metallic Cobalt Blue 168. Lesser wing coverts bright metallic Emerald Green; greater wing coverts metallic Ultramarine 270; remiges Dark Brownish Olive 129 with edges to scapulars and secondaries Cobalt Blue; wing lining white. Chin, throat, upper breast, and undertail coverts Sulfur Yellow; lower breast and belly Spectrum Yellow 55; small flecks on the upper breast and patch in the center of breast and belly Chrome Orange 16; pectoral tufts Flame Scarlet 15. Artist A. Sutherland described the soft-part colors of the living holotype as "Eye blood red; bill black; legs and feet blackish gray; soles of feet pale ochre yellow; skin around eye blackish brown."

Paratypes.—NMP No. 17803 and CMNH Nos. 36484 and 36486, collected from 4 to 7 May 1993 at elevations from 1,130 to 1,360 m (ca. $7^{\circ}27'N$, $126^{\circ}11'E$) on Mt. Puting Bato, in the Malayo River Drainage at the headwaters of the Agusan River, Barangay Liboton, Municipality of New Bataan, Davao del Norte Province, Mindanao. NMP No. 17802 and CMNH Nos. 35805 and 35806, collected on 19 and 21 May 1994 at elevations from 1,300 and 1,190 m respectively, at the type locality. FMNH Nos. 278131 to 278135 and USNM Nos. 581080 to 581091, all collected from 15 to 24 June 1965 at 976 to 1,982 m (i.e. 3,200 to 6,500 feet) at Mt. Mayo, Municipality of Mati, Davao Oriental Province, Mindanao by Dioscoro S. Rabor and colleagues.

Paratypic variation.—Adult males vary only slightly in the brightness of the yellow underparts and in the amount of orange in the center of the breast. These differences are individual



Fig. 2. Side view of the holotype of *Aethopyga linaraborae* shortly after it was captured on Mt. Pasian. Photo by A. P. Sutherland.

and are not related to collection locality. Females have more muted colors and lack the metallic sheen on the forehead, ear, uppertail coverts, and wing coverts; lack the orange pectoral tufts; and do not have yellow on the chin, throat, or upper breast. They also differ from the males in the following ways: head Dark Neutral Gray with trace of pale metallic Emerald Green edges to feathers; rump not clearly defined, as Olive-Green of back grades into olive Sulfur Yellow at base of tail; edges of tail feathers metallic Cobalt Blue; wing coverts Olive-Green; remiges edged with orangish Olive-Yellow 52; throat, upper breast, and flanks Yellowish Olive-Green 50 with Olive-Yellow streaks. For both sexes, bill color does not vary, iris color ranges from dark brick red to blood red, and the legs and feet vary from dark tannish brown to black. The sexes differ (*t*-test and Mann-Whitney *U*-test, $P < 0.01$) in wing chord, tail length, culmen length, and tarsus length, with males larger than females in all cases (Table 2).

Measurements of holotype.—Wing chord, 52.3 mm; tail, 37.8 mm; culmen, 24.3 mm; tarsus, 15.7 mm; body mass, 8.4 g. See Table 2 for summary statistics of all individuals measured.

Diagnosis.—*Aethopyga linaraborae* is most similar to *A. boltoni* (see Frontispiece). The males of both species have gray heads; olive backs; yellow rumps, throats, and upper breasts; yellow-

ish lower breasts and bellies with a central patch of orange; and orange pectoral tufts. They differ, however, in several characters. *Aethopyga linaraborae* has metallic plumage colors in the upper tail coverts, ear, lesser and greater wing coverts, and edges to the scapulars and secondaries that are lacking in *A. boltoni*. The metallic forehead is well developed and extends onto the crown in *A. linaraborae* but is nearly absent or more restricted to the forecrown in *A. boltoni*. The metallic color of the forehead is Emerald Green in *A. linaraborae*, pale Paris Green 63 in *A. b. boltoni*, and Ultramarine in *A. b. malindangensis*. Tail color also differs; in *A. linaraborae* it is dark Blackish Neutral Gray with metallic Spectrum Violet edges, whereas in *A. boltoni* it is pale Dark Brownish Olive with pale Paris Green edges.

Females of *A. linaraborae* and *A. boltoni* are similar in all plumage characters except the following: *A. linaraborae* lacks a well-defined yellow rump patch, has Blackish Neutral Gray tail feathers edged with metallic Cobalt Blue, has scapulars and secondaries edged with orangish Olive-Yellow, and has a clearly delineated throat with Yellowish Olive-Green with Olive-Yellow streaks. *Aethopyga boltoni* has a sharply defined Sulfur Yellow rump patch, elongated central tail feathers strongly edged in Paris Green, and a gray throat that contrasts poorly against the

darker gray sides of the head. Differences in tarsus length and wing chord between *A. linearaborae* and *A. boltoni* (all populations combined) are not significant (Table 2). However, significant differences exist between the two species in culmen length and tail length (one-way ANOVA by sex, $P < 0.01$), with the greater difference in tail length owing largely to the elongated central tail feathers in *A. boltoni*.

Distribution and habitat.—Lina's Sunbirds currently are known only from Mt. Pasian, Mt. Puting Bato, and Mt. Mayo in eastern Mindanao in the provinces of Davao del Norte and Davao Oriental between 7°00' and 8°00'N and 126°00' and 126°30'E. They live in montane mossy forest (forest type described in Dickinson et al. [1991]), usually from 1,200 m to the tops of the mountains (see Figs. 3 and 4). However, they have been recorded as low as 1,130 m. Assuming that they occur in all available habitats above 1,200 m within this limited distribution, their total range comprises about 770 km².

Habits.—Kennedy observed several individuals on Mt. Pasian in 1994. Two males were seen in the middle (ca. 5 m above ground) and upper canopy (ca. 8 m) of the forest perched alone and upright, giving a long, slender appearance. Kennedy also saw other individuals accompanying mixed flocks composed of Philippine Bulbuls (*Hypsipetes philippinus*), Elegant Tits (*Parus elegans*), Brown Tit-Babblers (*Macronous striaticiceps*), Mountain Leaf-Warblers (*Phylloscopus trivirgatus*), Mountain Verditer-Flycatchers (*Eumyias panayensis*), Metallic-winged Sunbirds (*Aethopyga pulcherrima*), White-bellied Flowerpeckers (*Dicaeum hypoleucum*), and Mountain White-eyes (*Zosterops montanus*).

Breeding.—No nests have been found, but all of the males collected from 3 to 22 May in 1993 and 1994 had enlarged left testes; one measured 4 × 2 mm, two 4 × 3 mm, and two 7 × 4 mm. Of the two females collected during the same period, one (with 20% cranial pneumatization) had an undeveloped ovary that was 4 × 3 mm, whereas the other (50% cranial pneumatization) had a developed ovary that was 7 × 4 mm.

Vocalizations.—The vocalizations of Lina's Sunbird have not been documented.

Conservation status.—Lina's Sunbird was common in the areas we inventoried, with individuals sighted regularly every day. Although it has a very restricted range, its habitat of mossy forest occurs in extremely rugged and inaccessible mountains that contain few commercial

TABLE 2. Measurements ($\bar{x} \pm SD$, with [n, range] in parentheses) of *Aethopyga linearaborae* and subspecies of *A. boltoni*.

Sex	Wing (mm)	Tail (mm)	Culmen (mm)*	Tarsus (mm)	Total length (mm)	Body mass (g)
<i>Aethopyga linearaborae</i>						
M	53.7 ± 1.3 (14, 51.7-55.8)	38.2 ± 1.5 (14, 36.4-40.4)	24.4 ± 1.1 (13, 22.3-26.3)	15.6 ± 0.5 (14, 14.5-16.3)	116.5 ± 2.1 (2, 115-118)	7.9 ± 0.7 (5, 7.0-8.7)
F	48.7 ± 1.1 (10, 46.6-50.2)	33.2 ± 0.8 (10, 32.1-34.4)	20.9 ± 1.1 (10, 19.3-22.8)	14.8 ± 0.4 (10, 14.1-15.4)	101.0 (1)	6.5 ± 0.7 (2, 6.0-7.0)
<i>A. boltoni boltoni</i>						
M	54.1 ± 1.3 (12, 51.7-55.9)	46.8 ± 1.8 (9, 44.0-49.6)	23.3 ± 0.7 (11, 22.2-24.5)	15.6 ± 0.3 (12, 15.1-16.0)	122.4 ± 7.8 (10, 109-133)	8.2 ± 0.9 (5, 7.0-9.2)
F	50.3 ± 0.9 (6, 49.0-51.5)	37.9 ± 1.1 (4, 36.5-39.2)	20.7 ± 0.9 (6, 19.0-21.2)	15.1 ± 0.4 (6, 14.6-15.5)	108.0 ± 6.2 (5, 99-114)	6.9 ± 0.4 (2, 6.6-7.2)
<i>A. b. tibolii</i>						
M	52.1 ± 0.5 (3, 51.6-52.5)	45.6 ± 1.2 (3, 44.3-46.4)	23.2 ± 1.0 (3, 22.1-23.8)	15.1 ± 0.3 (3, 14.9-15.3)	112.0 (1)	6.4 ± 1.5 (3, 4.9-7.8)
F	48.3 ± 1.0 (5, 47.3-49.8)	37.5 ± 0.5 (4, 36.9-38.0)	19.9 ± 0.9 (5, 19.1-21.2)	14.6 ± 0.2 (5, 14.3-14.8)	112.3 ± 7.1 (3, 106-120)	6.3 ± 0.3 (4, 6.0-6.6)
<i>A. b. malindangensis</i>						
M	53.9 ± 1.6 (14, 50.8-56.2)	46.8 ± 2.2 (13, 44.0-51.3)	23.3 ± 0.8 (14, 22.2-24.6)	15.8 ± 0.4 (15, 15.4-16.6)	No data	8.0 ± 0.5 (5, 7.5-8.7)
F	50.2 ± 1.2 (16, 48.5-52.4)	36.6 ± 1.7 (16, 33.1-38.8)	20.8 ± 0.8 (19, 19.3-21.9)	14.8 ± 0.3 (18, 14.1-15.2)	No data	7.1 ± 0.9 (8, 6.1-8.5)

* Measured from base of skull.



Fig. 3. View of the eastern slope of Mt. Pasian near its peak. Mt. Agtuuganon can be seen 6 km to the south. Photo by A. P. Sutherland.

tree species and generally are too steep for agricultural purposes. The area is inhabited mostly by small communities of Mandayas, who have lived in the area for centuries, practicing slash-and-burn agriculture and plantation farming on the more accessible flatter slopes.

The mossy forests within the PICOP logging concession around Mt. Agtuuganon and Mt. Pasian at the northern end of the species' range

have been recognized as a forest sanctuary. An access road has been built along the north/south ridge leading to Mt. Pasian, where PICOP and the Philippine Long Distance Telephone Company have built radio and telephone relay stations. PICOP controls access to the road and has an excellent record of managing and protecting its forests. Currently, the most serious threat to the mossy forest comes from the recent discov-



Fig. 4. Mossy forest at 1,200 m near the capture location of the holotype of *Aethopyga linaraborae*. Photo by A. P. Sutherland.

ery of gold in the region. Some lower slopes have been totally destroyed because of mining activities. Despite this, we do not consider most of the habitat threatened, either today or in the near future.

Remarks.—We are convinced that the morphological features exhibited by Lina's Sunbird reflect its unique evolutionary history and that it should be regarded as a separate species. The questions of whether *A. linaraborae* and *A. boltoni* are sister taxa, or whether *A. linaraborae* is affiliated with other *Aethopyga* sunbirds within Mindanao and the region, are unclear. We have frozen tissues of many of these forms that could be used for additional phylogenetic study.

Etymology.—Lina N. Florendo Rabor accompanied her husband, the preeminent Philippine ornithologist Dioscoro S. Rabor, on more than 40 scientific expeditions throughout the Philippines from 1936 to 1975 and contributed to some 80 papers and books published by Dr. Rabor and his colleagues. Throughout this extraordinary effort she remained a silent partner. We are pleased to name this new and beautiful sunbird after this remarkable person.

NEW APO SUNBIRD FROM SOUTHERN MINDANAO

Mt. Busa was surveyed by the PBI team from 20 March to 20 April 1993 at elevations from

850 to 1,710 m. The team obtained 10 specimens (skins with fluid-preserved bodies, two males and three females; whole fluid-preserved specimens, one male and four unsexed; frozen tissue, two males and one female) of the Apo Sunbird. We compared these specimens with all known populations of the species and concluded that the populations sorted out into three subspecies as follows: birds from Mt. Apo belong to *A. b. boltoni*; birds from Mt. Kitanglad (formerly spelled Katanglad) and Mt. Malindang belong to *A. b. malindangensis* (Dickinson et al. [1991] included Mt. Kitanglad birds with *boltoni*, an apparent mistake as they did not examine the specimens; here we follow the suggestion of Ripley and Rabor [1961]); and the populations from Mt. Busa and Mt. Matutum (Dickinson et al. [1991] listed Matutum birds with *boltoni*) are indistinguishable from each other and represent a new subspecies that we describe as

Aethopyga boltoni tibolii subsp. nov.

Holotype.—National Museum of the Philippines No. 17804, male (with 50% cranial pneumatization and left testis measuring 4×2 mm) collected 5 April 1993 at an elevation of 1,321 m (ca. $6^{\circ}05'N$, $124^{\circ}41'E$), 3.1 km south and 1.0 km east of the peak (2,064 m) of Mt. Busa in the

Pange River Drainage, Municipality of Kiamba, Sarangani Province, Mindanao, Philippines by the National Museum of the Philippines/Cincinnati Museum of Natural History Philippine Biodiversity Team, field number NMP/CMNH B2197.

Paratypes.—CMNH Nos. 36477, 36480, 36481, and NMP No. 17805, collected at the type locality, 4 to 15 April 1993, at 1,299 to 1,704 m; DMNH No. 14142, collected 29 January 1964, and FMNH Nos. 279623 to 279625, collected 16 to 17 June 1966, all from Mt. Matutum, Municipality of Tupi, South Cotabato Province, Mindanao by Dioscoro S. Rabor and colleagues.

Measurements of holotype.—Wing chord, 52.53 mm; tail, 46.40 mm; culmen, 23.79 mm; tarsus, 15.34 mm; body mass, 6.5 g. See Table 2 for summary statistics of all individuals measured.

Diagnosis.—Both sexes are most similar to *A. b. boltoni* of Mt. Apo but generally are less richly colored. Male *A. b. tibolii* have only a trace of the metallic Paris Green on the forehead that in most lighting situations is not visible; the patch in the center of the lower breast and belly is pale Orange Yellow 18, not Spectrum Orange, and is hardly perceptible against the pale Spectrum Yellow around it; and the pectoral tufts are lighter Flame Scarlet. In female *A. b. tibolii*, edges of the scapulars and secondaries are olive Sulfur Yellow, not dark Golden Olive-Yellow; chin and throat are pale gray finely streaked with white, not Grayish Olive 43; and the belly is paler Spectrum Yellow and has only a hint of Orange Yellow in its center. Immature male *A. b. tibolii* are paler than the adult males, having less yellow on the throat and lacking orange in the breast and belly; they also lack the orange pectoral tufts. Immature females are paler than the adult females.

For the measurements presented in Table 2, males are significantly larger than females (two-way ANOVA, $P < 0.01$) in all subspecies of *A. boltoni*. Among subspecies, *A. b. tibolii* is smaller than *A. b. boltoni* in wing chord, culmen length, and body mass and smaller than both *A. b. boltoni* and *A. b. malindangensis* in tarsus length (Dunn's multiple comparisons tests, $P < 0.05$). Differences in tail length among subspecies were not significant.

Distribution and habitat.—Currently known only from southern Mindanao on Mt. Busa, which lies on the border between the provinces of Sarangani and South Cotabato, and on the isolated volcano Mt. Matutum in the province of South Cotabato (Fig. 1). The two peaks are

approximately 50 km apart. Unexplored peaks besides Mt. Busa exist in the extensive range of mountains in southern Mindanao, where we predict the Apo Sunbird may be found. These include Parker Volcano 22 km east of Mt. Busa, Mt. Itim Itim 57 km northwest, and the Kidapong Range 40 km west-northwest (Fig. 1). If *A. b. tibolii* is found on these peaks, its entire range would lie between 6°00' and 6°45'N and 124°05' and 125°10'E.

Aethopyga b. tibolii occupies montane mossy forest on Mt. Busa from about 1,300 m to the summit at 2,064 m. On Mt. Matutum, Rabor obtained specimens from the summit (7,850 feet; recorded on Joint Operations Graphic Air maps as 7,500 feet, or 2,286 m) down to 823–1,128 m (i.e. 2,700–3,700 feet), the lowest elevation that any Apo Sunbird has been recorded.

Habits.—We have not seen *A. b. tibolii* in the field but suspect that it has similar habits to *A. b. boltoni* from Mt. Apo (see below).

Breeding.—No nests of *A. b. tibolii* have been found. The holotype collected on 5 April 1993 had an enlarged left testis measuring 4×2 mm, whereas an immature male (with 5% cranial pneumatization; left testis 1×0.5 mm) was obtained on 4 April 1993. Of three females collected in April 1993, one (20% cranial pneumatization) had a developed ovary measuring 6×3 mm, one (100% cranial pneumatization) had a developed ovary measuring 7×3 mm with the largest ovum 3×3 mm, and one (5% cranial pneumatization) had an undeveloped ovary measuring 4×3 mm.

Vocalizations.—No vocalizations of *A. b. tibolii* have been documented.

Conservation status.—Common in its limited habitat, for which there are no immediate threats. The Mt. Busa population extends the known range of this species on Mindanao.

Etymology.—Named after the T'Boli people, the original inhabitants of southern Mindanao where this subspecies is found, who still cling to many of their traditions.

APO SUNBIRD FROM MT. APO

During recent surveys of Mt. Apo (Fig. 1) we obtained new information on the Apo Sunbird. Kennedy and Miranda saw them singly, in pairs, in small groups, and in mixed flocks accompanying other montane species. They foraged in and around flowering trees and shrubs at all levels in the stunted montane mossy forest. E. A. Mearns (unpubl. data) found a nest of *A. b.*



Fig. 5. Hanging nest of *Aethopyga boltoni boltoni* suspended from a stem of tiger grass just before the terminal inflorescence, at 2,420 m on Mt. Apo. Photo by R. S. Kennedy.

boltoni on Mt. Apo in July 1904. Kennedy also found a nest of this species in a partially burned, remnant patch of montane mossy forest on Mt. Apo (see Fig. 5) at 2,420 m on 25 January 1995. He apparently flushed the female during nest construction. The female remained within 5 m of the nest, fluttering about the foliage and diving at Kennedy while carrying a piece of moss in her bill. The pendulous nest was about 8 cm wide \times 16 cm long, with an opening of about 3 cm. It was composed of mosses loosely woven together and laced with several spider or insect egg cases. It was suspended about 2.4 m from the ground on the end of a stem of tiger grass (*Thysanolaena latifolia*; locally called "bugong") just before the inflorescence.

Vocalizations.—Kennedy obtained the first known recordings (deposited in the Library of Natural Sounds, Cornell University) of *A. boltoni* on the upper slopes of Mt. Apo on 25 January 1995. The call consisted of one to six bubbling "peep" notes given while foraging. In a series, the first note was followed by a short pause with the remaining notes given in rapid succession.

SPECIMENS EXAMINED

AETHOPYGA BOLTONI BOLTONI

Mt. Apo: two females (American Museum of Natural History [AMNH]); three males and one female (CMNH); one male (Delaware Museum

of Natural History [DMNH]); four males and three females (FMNH); three males and one female (NMP); one male (USNM).

AETHOPYGA B. MALINDANGENSIS

Mt. Kitanglad: one male (AMNH); four males and two females (FMNH). Mt. Malindang: one male and one female (AMNH); 12 males and 11 females (FMNH); four males and two females (USNM); two males and two females (Yale Peabody Museum [YPM]).

AETHOPYGA B. TIBOLII

Mt. Busa: one male and two females (CMNH); one male and one female (NMP). Mt. Matutum: one female (DMNH); two males and one female (FMNH).

AETHOPYGA LINARABORAE

Mt. Mayo: three males and two females (FMNH); six males and six females (USNM). Mt. Pasion: one male and one female (CMNH); two males (NMP). Mt. Puting Bato: two males (CMNH); one female (NMP).

ACKNOWLEDGMENTS

We dedicate this paper to the late Dioscoro S. Rabor, whose pioneering efforts changed the course of ornithology and conservation in the Philippines. In ad-

dition, he obtained the first specimens of both taxa we described here. The untiring efforts of our field colleagues S. Babao, G. Balaquit, J. Brown, R. Brown, D. Busemeyer, E. Cañada, D. Cedeño, E. Dayos, M. Entrolizo, R. Fernandez, J. Ferner, D. Keller, P. Mag-salay, O. Puentes-pina, R. Puentes-pina, K. Reis, L. Ruedas, A. Sutherland, and of our numerous field assistants are greatly appreciated. This project would not have been possible without the support and cooperation of Director C. Catibog-Sinha and her dedicated staff from the Protected Areas and Wildlife Bureau of the Philippine Department of the Environment and Natural Resources (DENR). In Mindanao, we received tremendous support from L. Rivera (DENR), P. Guillen (DENR), T. Orlanes (DENR), Mayor J. Balajadia, D. Salvador of the Philippine Eagle Foundation, and the staff of PICOP Forest Resources, Inc. We also thank M. LeCroy and G. Barrowclough (AMNH), G. Hess (DMNH), D. Willard (FMNH), G. Graves (USNM), and F. Sibley (YPM) for allowing us to study specimens in their care. We appreciate the helpful comments of E. Dickinson, K. Parkes, D. Willard, R. Zink, and an anonymous reviewer. Thanks also to A. Adamson and R. Snodgrass for preparing the map, A. Broussard, J. Bailer, and M. Hughes for statistical analyses, and A. Buck for editing the manuscript. We thank M. Bitting for graciously volunteering to paint the frontispiece. We are particularly grateful to L. A. Butler for her generous hospitality in Manila. The NMP/CMNH Philippine Biodiversity Inventory in 1992 and 1993 was supported by a John D. and Catherine T. MacArthur Foundation grant awarded to Gonzales and Kennedy. Finally, we thank Outdoor Adventures for their unfailing assistance with field equipment since 1989, and Mrs. Eugene R. Farny, Jan and Joe Herron, and Pat and Kendall Spencer, who generously and continuously have funded Kennedy's Philippine studies over the past two decades. This is contribution No. 8 of the NMP/CMNH Philippine Biodiversity Inventory.

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Associate Editor: R. M. Zink