

BAND SIZES OF SOUTHEASTERN BRAZILIAN HUMMINGBIRDS

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Abstract.—Aluminum numbered bands have been used to mark Brazilian hummingbirds since 1993 to obtain biological data as well as ascertain movements and longevities. Bands should be made as narrow as possible by cutting close to the numbers because of the short length of the hummingbird tarsus. Different band lengths should be determined for different species.

TAMAÑO DE ANILLAS PARA ZUMBADORES BRAZILEÑOS

Sinopsis.—Picaflores Brasileños fueron anillados por la primera vez hasta Junio de 1993 a lo presente para obtenerse datos biológicos y de migración o movimiento y longevidades de las especies. Anillas deben ser cortadas finas e de acuerdo con la anchura de los pies para las diferentes especies debido sus diferentes tamaños.

In Brazil, a bird-banding program was officially established in 1977 (CEMAVE 1994). However, ten years earlier I was color banding ant-following birds at Belém (Oniki 1972, Oniki and Willis 1972) to study movements and biology. Even before that, Ruschi (1982) apparently marked hummingbirds with copper or tin bands. He claimed to have made some spectacular recaptures of banded hummingbirds (several *Anthracothorax nigricollis* banded in Rio Grande do Sul, recaptured in Espírito Santo and later at Belém), but did not provide convincing details.

Although the Brazilian bird-banding agency CEMAVE (presently Centro de Pesquisas para Conservação das Aves Silvestres) provides numbered aluminum bands for marking birds, hummingbird bands were not available until recent years. The smallest band provided by CEMAVE before 1993 was size C, which can be used for *Notiochelidon cyanoleuca* and other moderately small birds but not for such small-tarsused birds as *Lathotriccus euleri*, *Hemitriccus diops*, *Todirostrum poliocephalum*, and hummingbirds.

In 1993, 10,000 bands for Brazilian hummingbirds were provided at my request by Aracruz Celulose S. A., an eucalyptus-planting company from Espírito Santo, with an agreement that I help them train their workers in field studies and develop their faunal studies, especially for birds. The bands were later donated to CEMAVE, which made them available to banders of small birds and hummingbirds.

Since 1989, I have been visiting Espírito Santo and other southeastern Brazilian states to collect lice (Phthiraptera) as well as biological data from mist-netted hummingbirds and to determine their movements and longevities. Unlike much of North America, where there are few species of hummingbirds, the areas we visited were rich in species, which in term of bands means many sizes and types of tarsi. The present paper reports band sizes for Brazilian species of hummingbirds.

TABLE 1. Band lengths and mean body mass of hummingbirds from southeastern Brazil.

Band length (mm) and species	Mass ($\bar{x} \pm SD$) (g)	<i>n</i>	Location ^a
4.5			
<i>Phaethornis ruber</i>	2.46 ± 0.57	3	br
5.0			
<i>Calliphlox amethystina</i>	2.85 ± 0.33	28	st, cv, mv
<i>Lophornis magnifica</i>	2.66 ± 0.29	19	nl
<i>Phaethornis idaliae</i>	2.64 ± 0.19	7	cv
5.5			
<i>Chlorostilbon aureoventris</i>	3.94 ± 0.57	5	st, mv
<i>Chrysolampis mosquitus</i>	3.5	1	cv
<i>Hylocharis cyanus</i>	3.55 ± 0.76	4	cv
<i>Phaethornis squalidus</i>	3.38 ± 0.46	24	st, sl, nl
<i>Stephanoxis lalandi</i>	3.54 ± 0.43	9	mv
5.8			
<i>Amazilia lactea</i>	4.31 ± 0.49	8	vc, il
<i>Amazilia v. brevirostris</i>	4.27 ± 0.71	181	cv, st, sl, mv
<i>Amazilia v. versicolor</i>	4.06 ± 0.44	185	st, sl, mv, rs, cp, rs, nl
<i>Hylocharis chrysurus</i>	4.51 ± 0.47	8	il
<i>Hylocharis sapphirina</i>	4.45 ± 0.39	19	cv, pb
<i>Phaethornis eurynome</i>	5.31 ± 0.55	155	nl, rs, sl, ar, ag, cq
<i>Thalurania furcata</i>	4.8	1	vc
<i>Thalurania glaucopsis</i>	4.82 ± 0.60	880	st, nl, ag, mv
6.0			
<i>Amazilia fimbriata</i>	5.36 ± 0.52	5	ci, cv
<i>Heliomaster squamosus</i>	6.45 ± 0.21	2	st
<i>Phaethornis pretrei</i>	5.61 ± 0.56	124	st, sl, rs, vc, nl, ag
6.5			
<i>Glaucis dohrnii</i>	5.83 ± 0.50	3	pb
<i>Glaucis hirsuta</i>	7.46 ± 0.86	253	st, sl, cv, vc
<i>Leucochloris albicollis</i>	6.34 ± 0.81	585	st, sl, rs, nl
<i>Polytmus guainumbi</i>	5.70 ± 0	2	ir
7.0			
<i>Anthracothorax nigricollis</i>	7.22 ± 0.60	25	cv, pb, st, il
<i>Colibri serrirostris</i>	6.67 ± 0.88	321	st, ir, vc
<i>Melanotrochilus fuscus</i>	8.09 ± 0.98	2317	st, sl, vc, nl, ag
<i>Ramphodon naevius</i>	7.88 ± 1.19	366	sl
8.0			
<i>Aphantochroa cirrhochloris</i>	7.69 ± 0.69	878	st, sl, nl, rs
<i>Clytolaema rubricauda</i>	7.91 ± 1.10	1105	st, sl, rs, nl, ag
<i>Eupetomena macroura</i>	9.01 ± 0.90	474	st, sl, nl, rs, cv, vc, cq

^a See Materials and Methods for location codes.

MATERIALS AND METHODS

At Santa Teresa, Espirito Santo, hummingbirds were captured at the Santa Lúcia Biological Reserve (sl in Table 1; elevation 630 m, 19°58'S, 40°32'W), the Museu de Biologia Mello Leitão (st in Table 1; 680 m, 19°57'S, 40°36'W), Sítio Rincão do Serafim (rs in Table 1; 730 m, 19°57'S, 40°40'W), Vale do Canaã (vc in Table 1; 430 m, 19°55'S, 40°37'W), and the Nova Lombardia reserve—presently known as Augusto Ruschi Biological Reserve (nl in Table 1; headquarters 780 m, 19°55'S, 40°34'W). At Linhares, in the lowlands, captures were at the lake by the visitors' houses at CVRD (Companhia do Vale do Rio Doce Reserve; cv in Table 1; 50 m, about 19°10'S, 40°05'W).

In Bahia, captures were at the Pau-Brasil Ecological Station, Porto Seguro (pb in Table 1; 50 m, 16°24'S, 39°11'W) and at the Bralanda forest, Guarani (br in Table 1; 50 m, about 17°05'S, 39°20'W). In São Paulo, some hummingbirds were captured at the Itirapina railroad (ir in Table 1; 715 m, 22°14'S, 47°52'W) and lake (il in Table 1; 760 m, 22°15'S, 47°49'W), Cássia dos Coqueiros (cq in Table 1; 21°17'S, 47°10'W), and Fazenda Capricórnio (cp in Table 1; 30 m, 23°23'S, 45°04'W). In Santa Catarina, captures were at Caldas da Imperatriz (ci in Table 1; about 100 m, 27°40'S, 48°50'W). In Minas Gerais, I banded near Monte Verde, at the Fazenda-Hotel Itapuá (mv in Table 1; about 1000 m, 22°45'S, 46°00'W).

In 1989–1993, hummingbirds were marked individually by cutting a combination of wing and tail feathers. This method is only good for a short-term project, until birds molt (Oniki 1991). From June 1993–September 1995, I marked hummingbirds with numbered aluminum bands. Alternative methods such as painting the top of the head with nail polish or paint were messy and not very visible. Methods for individual recognition (Stiles and Wolf 1979), such as color-marking back feathers with spots of model airplane paint and using a plastic tag with strips of colored tape on the leg, were not used here.

Hummingbird bands (Graphics Unlimited, New Orleans, Louisiana) do not come as ready-to-use rings but as plates of aluminum 1100 alloy, printed with numbers and dividing lines that have to be cut, the edges smoothed, and then shaped as bands. As pointed out by Lloyd and Clench (1969), the bands have to be held with forceps, and this can sometimes scrape the soft metal or scrape off the numbers. One should be careful in handling the bands.

Bands were cut with small scissors or a special cutting device from the alloy plates of 300 bands. To make a circular band from the small straight piece of alloy cut around the number, I used a device similar to the one described by Lloyd and Clench (1969). This metal device, the cutting device, small pliers, a small scissor, and forceps are available as a set (MacDonald Hummingbird Band Forming Kit) from R. MacDonald, 850 Main Street, Lynnfield, Ma 01940.

RESULTS AND DISCUSSION

Bands were checked on individual hummingbirds and sizes determined (Table 1). Band lengths can be roughly estimated by checking the hummingbird mass. However, tarsus thickness and the way the foot closes can differ among species. Hermits of the genus *Phaethornis*, for instance, have very slender feet. When the feet are closed, a band barely larger than the tarsus can pass the toes and drop off. Even worse, until it drops the band can remain around the closed toes and prevent the bird from using that leg. This is why *Phaethornis eurynome*, weighing 5.3 g, requires a 5.8-mm band. In *Phaethornis squalidus*, if one uses bands larger than 5.5 mm, the band slides down when all toes are closed. On the other hand, *Thalurania glaucopis*, originally banded with 5.5-mm bands, proved to need size 5.8 mm, because a short band can cause foot infection and a 5.8-mm band does not pass the closed foot. We replaced several bands of 5.5 mm on recaptured *Thalurania glaucopis*. Bands were placed on the left foot but, when they caused problems, they were replaced by larger bands on the right foot.

Melanotrochilus fuscus is the only hummingbird in Table 1 that has a feathered outer side of the tarsus. Even though a 6.5-mm band will fit, I used 7.0-mm bands to avoid problems. There was only one case of *Melanotrochilus fuscus* without a foot, possibly caused by a band.

As a rule, all bands should be cut very close to the numbers so that the band is narrow, because most tarsi are rather short. This is especially so for *Thalurania glaucopis*, which had problems when bands were cut along the printed lines on the aluminum plate (i. e., bands were too wide). When bands are wide, they rub both above and below on the tarsus, causing swelling or infection; the foot can even drop off, as Reed (1953) warned.

When bands were closed well with both ends touching, there seemed to be no problems with bands falling off the feet (hummingbirds do not try to take them off with their bill, and they do not seem bothered by the extra weight on a foot). The edge of a band of one *Clytolaema rubricauda* caught in the net and was almost open enough to fall off when I retrieved the hummingbird.

The banding project helps train Brazilian undergraduate and graduate students to handle mist nets and captured birds as well as in obtaining morphometric data. We hope that more hummingbird-banding programs can be developed in other Latin-American countries in order to ascertain movements and/or migration as well as data on longevity.

Difficulties in banding Brazilian hummingbirds.—Hummingbirds are captured more easily near feeders or *Malvaviscus* sp., *Grevillea nana*, and similar flower-rich plants; large-scale captures of hummingbirds are difficult in the field because one catches very few individuals for the effort of setting up nets. Although I have had many recaptures at revisited areas, there are few banders, and no laymen have reported recoveries. Advertising with posters and other means that a project is under way might

increase recovery rates because, due to small band size, only the number is printed and an uninformed person will not know where to report the band.

Unlike North American bands, which come with 420 bands on a sheet (14.5 × 11.2 cm), Brazilian bands, although made by the same company, come on slightly smaller sheets (13.6 × 10.9 cm) with 300 bands. I wrote the company asking why this is so, because of the high costs to Brazilians and because of the alloy discarded, but have received no answer.

Another difficulty is that CEMAVE does not distribute bands according to project size. Banding hummingbirds at feeders can require many bands, as when I handled 535 hummingbirds and 9 other birds in 3 days at Monte Verde, Minas Gerais. Insufficient supply of bands by CEMAVE can limit field work on relatively distant and expensive expeditions.

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