

Destruction of its lowland forest habitat has isolated this small flycatcher in a relatively small number of localities spread over a relatively large area of south-east Brazil, eastern Paraguay and northern Argentina.

DISTRIBUTION The São Paulo Tyrannulet is endemic to the Atlantic Forest region of south-eastern Brazil in Espírito Santo (no records since 1942), possibly Minas Gerais (see Remarks), Rio de Janeiro, São Paulo, Mato Grosso do Sul (one record in 1930) and Santa Catarina, ranging into north-east Argentina in Misiones and south-eastern Paraguay. Unless otherwise stated, records in the following account are from north to south, and coordinates are from Paynter (1989) and Paynter and Traylor (1991).

Brazil

Espírito Santo Records are from: Chaves (Santa Leopoldina), August and October 1942 (Pinto 1944; specimens in MCZ, MZUSP); Segredo do Veado (Serra do Caparaó), 1,000 m, c.20°35'S 41°45'W, in or near the border of the present-day Caparaó National Park, October 1929 (specimen in AMNH).

Rio de Janeiro Although the state was included in the species's range by Meyer de Schauensee (1966), the evidence for this remains untraced. However, subsequent records are from: Morumbeca do Imbé, Desengano State Park, 600 m, February 1987 (J. F. Pacheco *in litt.* 1987); Poço das Antas Biological Reserve, under 100 m, October/November 1981 (Scott and Brooke 1985, D. F. Stotz *in litt.* 1991).

São Paulo Records are from: Corredeira das Flores (untraced), on rio Paranapanema, south of Assis, September 1943 (specimen in MZUSP); Victoria (now Vitoriana), 570 m, July 1902 (von Ihering and von Ihering 1907, Pinto 1944; specimen in MZUSP); Fazenda Cayoá (Caiuá, c.22°54'S 49°59'W, not as in GQR 1991), Salto Grande do Paranapanema (now Salto Grande), undated (von Ihering and von Ihering 1907); Ubatuba (Experimental Station), 50-400 m, sometime between June 1977 and July 1979 (Willis and Oniki 1981a), December 1990 and October 1991 (D. F. Stotz *in litt.* 1991); base of Pico do Corcovado, south of Ubatuba, September 1991 (TAP); Boracéia Biological Station, 850 m, January 1987 (D. F. Stotz *in litt.* 1991); Estação Engenheiro Ferraz (untraced, between São Paulo city and Santos), August 1964 (specimen in MZUSP); Carlos Botelho State Park, January 1990 (Pacheco and Fonseca 1990); Sete Barras, 150-400 m, sometime between February and July 1979 (Willis and Oniki 1981a); Laranja Azeda, c.24°20'S 47°52'W, August 1960, and Pousinho, rio Juquiá, c.24°22'S 47°49'W, November 1960 (specimens in FMNH); Fazenda Poço Grande, rio Juquiá, May 1940 (Pinto 1944); Ilha do Cardoso State Park, currently (P. Martuscelli *in litt.* 1991, D. F. Stotz *in litt.* 1988, 1991). E. O. Willis (*in litt.* 1986) had records from six unspecified localities in the state.

Mato Grosso do Sul One specimen from Campanário, 350 m, June 1930 (in AMNH), is the only record.

Paraná Records are from: "Salto do Guayra" (Salto das Sete Quedas, now inundated by a reservoir, 24°02'S 54°16'W), possibly this species, February 1923 (Sztolcman 1926); Guaíra, 200 m, April 1930 (specimens in AMNH); the municipality of Castro (including Caxambú Forest Park), recently (L. dos Anjos *in litt.* 1987); Iguaçu National Park, 1977, 1980-1990 (TAP, R. S. Ridgely verbally 1987), August 1990 (Wilcove 1992) and July 1991 (M. Pearman *in litt.* 1991); Cubatão, 25°50'S 48°48'W, 100-200 m, 1950 (Straube 1990, P. Scherer Neto *in litt.* 1986).

Santa Catarina Records are from a single locality near Joinville: Salto do Pirahy (Piraí), 150 m, June 1929 (specimen in AMNH), and specifically 8 and 9 km north-north-west of Vila Nova, July 1991 (M. Pearman *in litt.* 1991; see Measures Proposed).

Argentina The species is only recorded from northern Misiones, where one bird was banded in September 1978 (Olrog 1979), this having taken place in Iguazú National Park (J. C. Chebez *in litt.* 1992), and others were seen in the park in December 1982 and January 1988 (F. N. Moschione *per* J. C. Chebez *in litt.* 1992), December 1986 (B. M. Whitney and R. H. Barth *in litt.* 1986) and January 1990 (B. M.

López Lanús *in litt.* 1991); however, in the absence of a photograph or skin these first reports for the country must remain technically open to question (J. C. Chebez *in litt.* 1992).

Paraguay Records are from: (*Canindeyú*) Estancia La Fortuna (untraced), Mbaracayu, recently (R. S. Ridgely *per* M. G. Kelsey verbally 1992); (*Caaguazú*) east of Yhú (lumber camp San Antonio), 300 m, January 1931 (specimen in AMNH); upper río Iguazú, 25°20'S 55°00'W, 300 m, January 1931 (specimen in AMNH); (*Alto Paraná*) Puerto Bertoni, 25°38'S 54°40'W, June 1917 (specimen in FMNH; hence Bertoni 1939).

POPULATION This species, because inconspicuous and difficult to identify, may have been under-recorded; nevertheless it has been considered very local and uncommon in south-east Brazil (M. Pearman *in litt.* 1991). There are no recent records from Espírito Santo and only a few from Rio de Janeiro, where it has been considered locally uncommon (Scott and Broke 1985) or rare (J. F. Pacheco *in litt.* 1987). In São Paulo it is fairly common but local at the base of the Serra do Mar around Ubatuba and on Ilha do Cardoso (P. Martuscelli *in litt.* 1991, D. F. Stotz *in litt.* 1991), and while 13 birds per hundred hours of observation have been recorded at both Ubatuba and Sete Barras (Willis and Oniki 1981a), the species was considered uncommon at Carlos Botelho State Park (Pacheco and Fonseca 1990), though this corresponded to 3-5 birds per ten hours of observation. In Paraná the species is considered rare (P. Scherer Neto *in litt.* 1986, F. C. Straube *in litt.* 1991), although not apparently around Castro (L. dos Anjos *in litt.* 1987). There is a moderately large population, possibly in the low thousands, in Iguaçu National Park, where up to 12 individuals can be noted in a day along the Poço Preto trail, the species doubtless being overlooked owing to its weak voice, small size and preference for shady places well above ground (TAP). In Argentina it is considered a rare and little known species (Canevari *et al.* 1991), very infrequent in Iguazú National Park (M. Pearman *in litt.* 1991), although the fact that it has been recorded from second growth may indicate that the species is commoner there than it is currently recognized (B. M. Whitney and R. H. Barth *in litt.* 1986), and indeed the preceding comments concerning Iguaçu on the Brazilian side probably apply. The population status of the species in Paraguay is not known, but from the scarcity of records it appears that it is rare (F. E. Hayes *in litt.* 1991).

ECOLOGY The São Paulo Tyrannulet has been recorded mainly from under 400 m on the coastal slopes of the Serra do Mar and along rivers of the rio Paraná basin; at least one of the few records above 500 m (see Distribution), at Boracéia, was interpreted as a bird wandering upslope from the base of the mountain (D. F. Stotz *in litt.* 1991). On the higher slopes of Pico do Corcovado, south of Ubatuba, the species seems to be replaced by Oustalet's Tyrannulet *Phylloscartes oustaleti* (TAP). It occurs primarily in the lower canopy and upper middle storeys of fairly mature forest (TAP), usually in the interior (E. O. Willis *in litt.* 1986, D. F. Stotz *in litt.* 1988, 1991, B. M. López Lanús *in litt.* 1991, M. Pearman *in litt.* 1991; specimen in MZUSP), and at Iguaçu and near Ubatuba far from the sunlit edges (TAP), but also at least occasionally along edges (Scott and Brooke 1985, D. F. Stotz *in litt.* 1988, 1991, B. M. Whitney *in litt.* 1991) and even in second growth (Scott and Brooke 1985, B. M. Whitney and R. H. Barth *in litt.* 1986, B. M. Whitney *in litt.* 1991). The interior forest habitat of the species at the base of Pico de Corcovado is tall and epiphyte-laden with numerous large lianas, and is thus (presumably) relatively undisturbed and mature; forest at Iguaçu, although apparently cut over in the distant past, is probably structurally similar to its original state (TAP). All of more than 50 observations (mainly along the Poço Preto road) in Iguaçu National Park (1977, 1980-1990) were of pairs or presumed families of 3-4 individuals that foraged in shady areas at mid-heights (10-14 m) in the crowns of medium-sized trees; they less frequently ranged up into the lower parts of the tallest trees, or down into the upper undergrowth at c.3 m (TAP).

Pairs or families usually foraged within the crown of a single tree or two adjacent trees, staying in close visual and vocal contact, and occasionally perching on thin vines near trunks and sallied to nearby leaves and vinestems; individuals typically perched upright on slender horizontal branches while scanning the surrounding foliage, and made upward vertical or diagonal sallies (up to 0.5 m) to small and medium-sized leaves (TAP). They also hover-glean the tips of leaves and stems, and sometimes clamber under clusters of leaves (B. M. Whitney and R. H. Barth *in litt.* 1986, M. Pearman *in litt.* 1991, B. M. Whitney *in*

litt. 1991). Similar behaviour was observed on the lower slopes of Pico do Corcovado south of Ubatuba, where pairs or family parties foraged with mixed-species flocks in the lower canopy of 30 m tall forest (TAP). Prey items were usually too small to identify, but several looked like small green orthopterans (TAP). Birds regularly if not constantly follow mixed-species flocks (M. Pearman *in litt.* 1991, D. F. Stotz *in litt.* 1991; specimen in MZUSP), often comprised at Iguaçu of Ochre-breasted Foliage-gleaner *Philydor liechtensteini*, Streaked Xenops *Xenops rutilans*, Plain Antvireo *Dysithamnus mentalis*, the similar-looking Southern Bristle-tyrant *Pogonotriccus eximius*, Golden-crowned Warbler *Basileuterus culicivorus* and Red-crowned Ant-tanager *Habia rubica* (TAP).

Year after year at Iguaçu pairs or families were encountered in the same relatively small areas (within 1 ha) in shady forest, and such territorial pairs seemed to be widely separated; response to playback of songs (including antiphonal duets of male and female) was strong and prolonged (TAP). Testes of one specimen from Serra do Caparaó, October, were fairly enlarged, while those of specimens from Paraná and Paraguay, April and January, were not enlarged (in AMNH). There is no other information on breeding.

THREATS Forest destruction within the species's range (and specifically within its altitudinal range) has been extensive, so that very little remains on the lowest slopes of the Serra do Mar and adjacent lowlands. Although the species occurs in a few reserves, these are too far apart and numbers observed remain too small to be confident about its long-term conservation.

MEASURES TAKEN The species has been recorded from Desengano, Ilha do Cardoso and Carlos Botelho State Parks, Poço das Antas Biological Reserve in Brazil, and Iguaçu and Iguazú National Parks in Brazil and Argentina (but see Threats).

MEASURES PROPOSED Studies at sites in São Paulo where this species is still relatively common would help provide ecological data valuable both for the management of the species at those sites and for its further study and conservation in areas where it is rarer. Support for the existing protected areas where it occurs must be maintained. Moreover, consideration of a reserve at Salto do Pirai, Santa Catarina, has been suggested, as this is the only locality in the state for the species and one of only two known in the world for Kaempfer's Tody-tyrant *Hemitriccus kaempferi* (see relevant account).

REMARKS A bird closely matching the species was described by a member of a Victor Emanuel Nature Tour during a visit to the Caratinga Reserve (Fazenda Montes Claros) in eastern Minas Gerais in October 1990 (R. S. Ridgely verbally 1992).