

Occurrence of the Eastern Slaty Thrush (Turdidae) in southern Brazil during the non-breeding season

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ABSTRACT: There are many gaps in the knowledge about Neotropical bird migration patterns. Among these gaps is the presence of some non-migrating individuals at their breeding sites, outside their wintering grounds. There is evidence that *Turdus subalaris* can occur in southern Brazil during the non-reproductive period. The objective of this work was: (1) to verify possible occurrences of *T. subalaris* in southern Brazil during its non-breeding season and; (2) to relate these occurrences to years of harsh winters (caused in southern Brazil mainly by the influence of the climatic phenomenon La Niña). After synthesizing specific literature data and ornithological collection records, the occurrence data were compared with the climatic events of the preceding years. Thirteen *T. subalaris* individuals were recorded in southern Brazil during the breeding season between 1973 and 2013. Eight of these records (61.53%) occurred in years preceded by harsh winters. These new data indicate that migration dynamics in *T. subalaris* is more complex than previously thought, indicating that forest formations in southern Brazil may act as habitats for this species during the post-reproductive resting period.

KEY-WORDS: Breeding sites, *Turdus subalaris*, migration, wintering grounds

INTRODUCTION

Birds of the Turdidae family are well-distributed over the different Brazilian ecosystems, but the ecology of some species is still poorly understood (Vogel *et al.* 2013), including *Turdus subalaris* (Seebohm, 1887), commonly called the Eastern Slaty Thrush. According to Sibley & Monroe (1993), the taxonomic status of this species is controversial, with *T. subalaris* considered a subspecies of *Turdus nigriceps* (subsp. *subalaris*), in accordance with Collar (2005). Aspects of the migration of the species *T. n. nigriceps* with Andean populations have been well documented (Capllonch *et al.* 2008a). However, this study considered them distinct species, in agreement with the Brazilian Ornithological Committee Records (CBRO 2014).

Studies on the migratory patterns of *T. subalaris* have so far been carried out on a local scale, and have focused on the *Cerrado* biome, more specifically in Brasília-Federal district (Antas & Valle 1987; Ferreira & Bagno 2000). It has been suggested that in winter (the non-breeding period), *T. subalaris* occurs in southern Mato Grosso state, the states of Rio de Janeiro, Minas Gerais and the Distrito Federal (Sick 1997; Ridgely & Tudor 2001; Sigrist 2006). Ferreira & Bagno (2000) recorded *T. subalaris*

in September and October in Brasília. This shows that the wintering grounds of this species are probably more northerly, in ecotone areas between the Amazonia and *Cerrado* biomes, in the states of Pará and Mato Grosso. This is also supported by the more recent records of Mestre *et al.* (2011) and Somenzari *et al.* (2011).

In southern Brazil, *T. subalaris* has been reported from early September to late January (rarely until April), during its breeding season (Belton 1985; Collar 2005). Most of the information on the species is still based on general literature sources such as Belton (1985), Sick (1997), Clement (2000), Ridgely & Tudor (2001), Collar (2005) and Sigrist (2006). In general, these authors report that the species occurs in southern Brazil during the breeding season.

In March (autumn) of 2009 one juvenile *T. subalaris* was captured in Guarapuava (Paraná state; more details can be found in Vogel *et al.* 2012a). Ghizoni-Jr *et al.* (2013) have also disclosed an older record of *T. subalaris* from Santa Catarina state during the winter of 1984. The presence of individuals in later periods (autumn occurrences) can also be interpreted as variations in inter-annual migratory patterns (Antas & Valle 1987). According to Belton (1985), during more rigorous and dry winters, the arrival of *T. subalaris* in southern Brazil

occurs later than in years of milder winters. Rigorous and dry winters in southern Brazil occur mainly during La Niña years (Grimm *et al.* 2000; Marengo 2007).

Therefore, if La Niña can really influence migration patterns in *T. subalaris*, records of this species in southern Brazil during the non-breeding season are predicted to be preceded by winters under the influence of La Niña. The aim of this work was to: (a) search for evidence to support the hypothesis that individuals of *T. subalaris* can also occur in southern Brazil in their non-breeding period and (b) investigate if there is any relationship between such occurrences and years under the influence of rigorous winters.

MATERIALS AND METHODS

Southern Brazil [states of Paraná, Santa Catarina and Rio Grande do Sul; ca. 576.5 km² according to IBGE (2013)] has a subtropical or temperate climate, with annual mean temperatures between 12 and 22°C. In Paraná, a tropical climate predominates in the north, while a humid subtropical climate prevails in the south. Santa Catarina and Rio Grande do Sul are more influenced by cold air masses from the South Pole; thus, a humid subtropical climate is predominant in these states, with annual mean precipitation between from 1250 and 2000 mm, except along the coast of Paraná and western Santa Catarina, where rainfall is excessive (up to 2000 mm), with vegetation composed of rainforests along the coast and prairie-like vegetation in the south (Grimm *et al.* 2000; Maack 2002; Ab'Saber 2003).

Turdus subalaris records in southern Brazil were sought, with May through August defined as the non-breeding season, as records up to April are considered late migrants to southern Brazil (Belton 1985). Records of *T. subalaris* in southern Brazil were sought in: (a) Web databases (Xeno canto Foundation[®] – XC [http://www.xeno-canto.org], WikiAves[®]– WA [http://www.wikiaves.com.br] and Ebird[®]– EB [http://www.ebird.org]); (b) Voucher specimens deposited in scientific collections in Paraná (Natural History Museum Capão da Imbuia – MHNCI), Santa Catarina (Zoological Collection of the University of Blumenau – CZFURB and Bird Collection of the Zoology Laboratory of the University of Western Santa Catarina – CLZU), and Rio Grande do Sul (Science and Technology Museum of the Pontifical Catholic University – MCTPUCRS and Natural Sciences Museum of Zoobotany Foundation – MCNFZ) states; and (c) Literature records retrieved through the Scirus web data base (http://www.scirus.com) until September 2013. Furthermore, a personal record obtained in 2013 was included in the analyses.

Records were summarized and the occurrence and intensity of climatic phenomena such as La Niña and El Niño were checked for the winter preceding each record. Climate data was provided by the National Oceanic and Atmospheric Administration (NOAA 2013). Lastly, a chi-square test with the Yates' correction ($\alpha = 0.05$) was performed to compare the proportion of records of *T. subalaris* obtained during years followed by La Niña, El Niño as well as those without the presence of these atmospheric phenomena.

TABLE 1. Records of *Turdus subalaris* in southern Brazil during the non-breeding period. PCP = presence of climatic phenomenon in the winter preceding the record. (+) corresponds to the number of winter months under the influence of La Niña (La) or El Niño (El). (♂, ♀, Y, A) represent male, female, young and adult, respectively.

Author	Source	Date	City	PCP
1. Czaban, R. E.	WA - 79584♂A	July/22/2001	Curitiba, PR	La ++++
2. Linkowski, A.	EB - S9093688	August/15/2009	Morretes, PR	La++
3. Lorin, D.	WA - 373726♀Y	June/17/2011	Apucarana, PR	La ++++
4. Vogel, H. F.	pers. obs. ♂A	May/05/2013	Guarapuava, PR	---
5. Rosário, L. A.	CZFURB -1529♀A	July/14/1984	Florianópolis, SC	---
6. Straube, F. C.; Urben-Filho, A.	MHNCI - 5196♂A	May/08/1999	Itajaí, SC	La +++
7. Olmos, F.	WA - 148649♂Y	May/29/2010	Lajes, SC	El ++++
8. Amorim-Neto, A.	WA - 401091♂A	May/24/2011	São Joaquim, SC	La+++
9. Volkmann, K. M.	WA - 401702♂A	June/24/2011	Pomerode, SC	La+++
10. Miguel, V. S.	WA - 358625	June/25/2011	Itajaí, SC	La+++
11. Freitas, P. A.	WA - 348398♂A	August/12/2011	Santo Amaro da Imperatriz, SC	La+++
12. Belton, W.	in litt. (1985) c.f. ♂	August/24/1973	São Leopoldo, RS	El ++++
13. Godinho, D.	WA - 1017153♂A	July/11/2013	Canela, RS	---

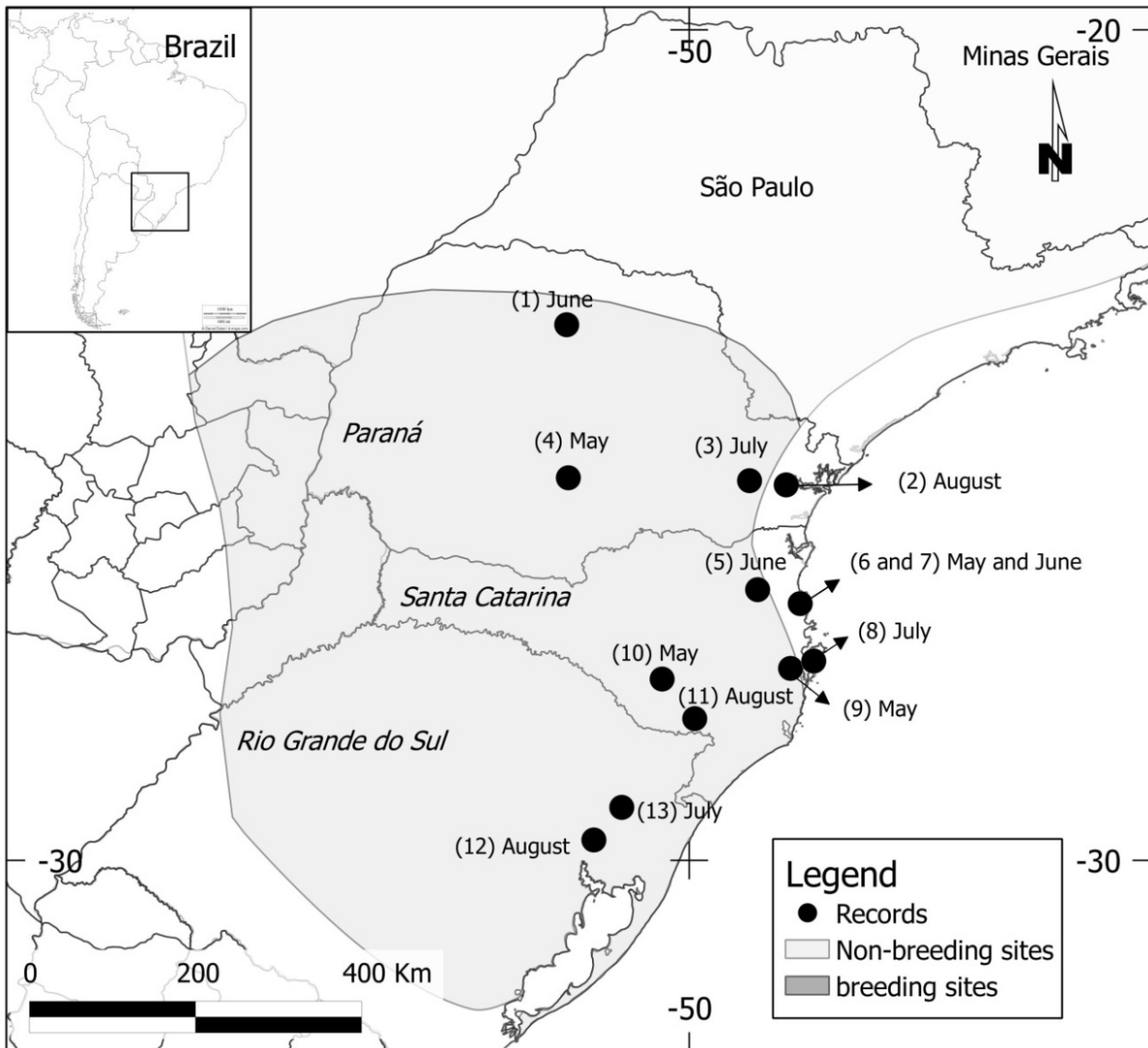


FIGURE 1. Records of *Turdus subalaris* in southern Brazil during the non-breeding season. The geographic range of the species was based on Ridgely *et al.* & BirdLife International (2012). The numbers represent the records in Table 1.

RESULTS

There were 13 records of *T. subalaris* in southern Brazil between 1973 and 2013, covering the non-breeding season (May 5th to August 15th; Table 1, Figure 1). Eight of these records (61.53%) occurred during years followed by harsh winters under the influence of La Niña (Table 1). In contrast, two records were preceded by El Niño years, and three were without the presence of these atmospheric phenomena. However, the higher frequency of records following La Niña winters was not statistically significant ($\chi^2_{\text{Yates}} = 3.25$, $df = 2$, $P = 0.19$).

DISCUSSION

There are important gaps in the knowledge concerning the migratory behavior of bird species (Alves 2007). Here, it is demonstrated that *Turdus subalaris* occurs in southern

Brazil during the non-reproductive period; however, the possibility of reaction to the La Niña phenomenon is weakly supported by the chi-square test, as a non-significant association was recovered.

The recorded observations in this region during the winter might be of young individuals that remained in their birth area until becoming adults and later migrating the following year, similar to the pattern observed for birds of the families Charadriidae and Scolopacidae (Campos *et al.* 2008, p. 41). This hypothesis is based on the records of a young male in late autumn and a young female in winter (Table 1).

The migration of *T. subalaris* is possibly very similar to that of *Turdus amaurochalinus* (Capllonch *et al.* 2008b). Populations of migrating individuals might overlap with those of non-migrating populations. In this case, a portion of the population might cease migrating due to the seasonal availability of resources or to favorable conditions at the resting or breeding sites (Sick 1997;

Alves 2007). It is worth noting that *T. subalaris* and *T. amaurochalinus* are morphologically very similar (Vogel *et al.* 2012b) and juveniles of the former species can be confused with females of the latter (Belton 1985). Accordingly, *T. subalaris* can only be identified from spring onwards, when its breeding activities start and allow identification through its distinctive vocalization (Ridgely & Tudor 2001; Collar 2005). Evidence of this is that some skins deposited at the MCNFZ had not been identified yet with certainty as either *T. subalaris* or *T. amaurochalinus*.

Intense winters on preceding years do not conclusively explain *T. subalaris* occurrences in southern Brazil between late autumn and winter. More records are needed to establish a more reliable pattern. Necessary for long migration needs, such as weight gain and molting, food resources probably become scarce in colder and drier winters (Sillert *et al.* 2000; Capllonch *et al.* 2008a). The effect of atmospheric phenomena such as El Niño and La Niña in the winter resting areas of the species is still little known. These phenomena can certainly influence migration patterns, due to rainfall dynamics affecting the availability of resources (Joseph 1996; Marengo 2007). Although such inferences are speculative, the family Turdidae can change its reproductive strategies in atypical climate years (Richmond *et al.* 2007).

The records from Paraná state confirm the observations of Sick (1997) and Sigrist (2006), that the species is capable of occupying moist araucaria and seasonal forests during the non-breeding season. However, the records from Morretes, Santo Amaro da Imperatriz, and especially Itajaí, show that the species can also occur in transitional forests on the Santa Catarina state coast. This is corroborated by data recently published by Ghizoni-Jr *et al.* (2013), who present an older record of a female *T. subalaris* collected on the island of Santa Catarina.

The range of this species should be better studied, because the growing number of records of *T. subalaris*, mainly in Rio Grande do Sul state, has intensified from the mid-twentieth century onward (Belton 1985, p. 110). Perhaps this process partially explains the occurrences recorded outside the breeding area proposed by Ridgely & Tudor (2001); however, only extensive banding records and new monitoring endeavors will help elucidate the complex migratory patterns of this species.

In summary, there are records of *Turdus subalaris* (males, females, juveniles and adults) in southern Brazil throughout the non-reproductive period; however, it is plausible that these winter records are sporadic. There is also evidence that the presence of climatic phenomena such as El Niño and La Niña may be related to the presence of *T. subalaris* in southern Brazil during the non-breeding season, but due to the lack of a greater number of records, a strong cause - effect relationship cannot be established yet.

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REFERENCES

- Ab'Saber, A. N. 2003. *Os domínios de natureza no Brasil: potencialidades paisagísticas*. São Paulo: Ateliê Editorial, 159 p.
- Alves, M. A. S. 2007. Sistemas de migrações de aves em ambientes terrestres no Brasil: exemplos, lacunas e propostas para o avanço do conhecimento. *Revista Brasileira de Ornitologia*, 15(2): 231-238.
- Antas, P. T. Z. & Valle, M. P. 1987. Dados preliminares sobre *Turdus nigriceps* no Distrito Federal. In: II Encontro Nacional de Anilhadores de Aves, n. 2, Rio de Janeiro, 1987. *Anais...* Editora UFRJ. 1987, 213-220.
- Belton, W. 1985. Birds of Rio Grande do Sul, Brazil, part 2. Formicariidae through Corvidae. *Bulletin of the American Museum of Natural History*, 180: 01-242.
- Campos, C. E. C., Naiff, R. H. & Araújo, A. S. 2008. Censo de aves migratórias (Charadriidae e Scolopacidae) da Porção Norte da Bacia Amazônica, Macapá, Amapá, Brasil. *Ornithologia*, 3(1): 38-46.
- Capllonch, P.; Soria, K.; & Ortiz, D. 2008a. Comportamiento migratorio del Zorzal Plumizo (*Turdus nigriceps nigriceps*) en Argentina. *Ornithologia Neotropical*, 19(2): 161-174.
- Capllonch, P., Ortiz, D. & Soria, K. 2008b. Migración del Zorzal común *Turdus amaurochalinus* (Aves, Turdidae) en Argentina. *Revista Brasileira de Ornitologia*, 16(1): 12-22.
- Clement, P. 2000. *Thrushes*. Princeton, NJ: Princeton, 424 p.
- Collar, N. J. 2005. Family Turdidae (Thrushes). In: J. Del Hoyo; A. Elliot; D. A. Christie (ed.), *Handbook of the Birds of the World*. Barcelona: Lynx Edicions, 514-811.
- CBRO - Comitê Brasileiro de Registros Ornitológicos. 2014. Lista das aves do Brasil, 11ª edição. <http://www.cbro.org.br/CBRO/pdf/AvesBrasil2014.pdf> (access on 06 January 2014).
- Ferreira, A. A. & Bagno, M. A. 2000. Período de permanência de *Turdus nigriceps* Seebohn, 1887 (Aves, Passeriformes, Turdinae) no Distrito Federal. *Revista Brasileira de Ornitologia*, 8(1): 45-47.
- Ghizoni-JR, I. R., Farias, F. B., Vieira, B. P. Willrich, G., Silva, E. S., Mendonça, E. N., Albuquerque, J. B. L., Ass, D. A.; Ternes, M. H., Nascimento, C. E. Roos, A. L., Couto, C. C. M., Serrão, M., Serafini, P. P., Dias, D., Fantacini, F. M., Santi, S., Souza, M. C. R., Silva, M. S., Barcellos, A. Albuquerque, C. & Espínola, C. R. R. 2013. *Checklist da avifauna da Ilha de Santa Catarina, Sul do Brasil. Atualidades Ornitológicas*, 171: 50-75.
- Grimm, A. M., Barros, V. R. & Doyle, M. E. 2000. Climate

- variability in Southern South America associated with El Niño and La Niña events. *Journal of Climate*, 13(1): 35-58.
- IBGE - Instituto Brasileiro de Geografia e Estatística. 2012.** *Estados*. www.ibge.gov.br/estadosat (access on 09 July 2012).
- Joseph, L. 1996.** Preliminary climatic overview of migration patterns in South America austral migrant passerines. *Ecotropica*, 2: 185-193.
- Maack, R. 2002.** *Geografia física do Estado do Paraná*. 3 ed. Curitiba: Imprensa Oficial, 440p.
- Marengo, J. A. 2007.** *Mudanças climáticas globais e seus efeitos sobre a biodiversidade - Caracterização do clima atual e definição das alterações climáticas para o território brasileiro ao longo do Século XXI*. 2 ed. Brasília: Ministerio do Meio Ambiente, 214p.
- Mestre, L. A. M., Rechetelo, J., Cochrane, M. A. & Barlow, J. 2011.** Avifaunal inventory of a Southern Amazonian transitional forest site: the São Luiz farm, Mato Grosso, Brazil. *Boletim do Museu Paraense Emílio Goeldi. Ciências Naturais*, 6(2):147-161.
- NOAA - National Oceanic and Atmospheric Administration. 2013.** Changes to the Oceanic Niño Index. www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears.shtml (access on 01 January 2013).
- Richmond, S., Nol, E., Campbell, M. & Burke, M. D. 2007.** Conspecific and Interspecific Nest Reuse by Wood Thrush (*Hylocichla mustelina*). *Northeastern Naturalist*, 14(4): 629-636.
- Ridgely, R. S. & Tudor, G. 2001.** *The Birds of South America. Vol II. The Oscine Passerines*. Austin, University of Texas Press, 940p.
- Ridgely et al. & BirdLife International. 2012.** Digital Distribution Maps of the Birds of the Western Hemisphere, version 5.0. In BirdLife International and NatureServe. *Bird species distribution maps of the world*. www.biodiversityinfo.org (access on 01 January 2012).
- Sibley, C. G. & Monroe, B. L. 1993.** *Supplement to Distribution and Taxonomy of Birds of the World*. New Haven and London: Yale University Press, 108p.
- Sick, H. 1997.** *Ornitologia Brasileira*. Rio de Janeiro: Nova Fronteira, 862p.
- Sigrist, T. 2006.** *Aves do Brasil: Uma Visão Artística*. São Paulo: Fوسفertil, 672p.
- Sillett, T. S., R. T. Holmes. & Sherry, T. W. 2000.** Impacts of a global climate cycle on population dynamics of a migratory songbird. *Science*, 288: 2040-2042.
- Vogel, F., Zawadzki, C. H. & Metri, R. 2012a.** Occurrence of thrushes in an urban fragment of Araucaria forest in southern Brazil. *Biota Neotropica*, 12(4): 243-247.
- Vogel, H. F., Miranda, J. M. D., Zawadzki, C. H. & Metri, R. 2012b.** Similaridade morfológica entre turdídeos sintópicos em um parque urbano na Região Sul do Brasil. *Sitientibus. Série Ciências Biológicas*, 12(2): 333-338.
- Vogel, H. F., Silva, J. C. B., Zawadzki, C. H. & Campos, J. B. 2013.** Research Into Brazilian Thrushes: Bibliographies, Species and Next Steps. *Bioscience Journal*, 29(2): 468-477.

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