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FIRST DESCRIPTION OF THE NEST OF THE BROWN-BREASTED PYGMY-TYRANT (*HEMITRICCUS OBSOLETUS*) AND ADDITIONAL INFORMATION ON THE NESTING OF THE STRIOLATED TIT-SPINETAIL (*LEPTASTHENURA STRIOLATA*)

Glayson Ariel Bencke¹, Carla Suertegaray Fontana², Jan Karel F. Mähler Jr.² &
Cristian Marcelo Joenck²

¹Rua Balduino P. Vier 413, Estrela, 95880-000, RS, Brazil. *E-mail*: gbencke@terra.com.br

²Museu de Ciências e Tecnologia, PUCRS, Caixa Postal 1429, Porto Alegre, 90619-900, RS, Brazil. *E-mail*: carla@pucls.br

Resumo. – Primeira descrição do ninho da Catraca (*Hemitriccus obsoletus*) e informações adicionais sobre a nidificação do Grimpeirinho (*Leptasthenura striolata*). – Descrevemos os ninhos de dois passeriformes endêmicos da Mata Atlântica, a Catraca (*Hemitriccus obsoletus*, Tyrannidae) e o Grimpeirinho (*Leptasthenura striolata*, Furnariidae), com base em observações realizadas no Rio Grande do Sul, Brasil. O ninho da Catraca não era conhecido, enquanto que o do Grimpeirinho é apenas brevemente descrito na literatura. Um ninho de Catraca foi encontrado em Monte Alverne, em novembro de 1994. Este diferiu do ninho de outros *Hemitriccus* spp. principalmente por não ser pendente, sendo fixado lateralmente a colmos verticais de taquarilha (*Chusquea* sp.). Esse método de fixação pode ter sido determinado por condições ambientais desfavoráveis à fixação de ninhos pendentes. Porém, se esse for o tipo de ninho usual da espécie, duas interpretações parecem plausíveis. O ninho não pendente pode ser uma adaptação vantajosa para nidificação em taquarais e interpretado como uma sinapomorfia das espécies de *Hemitriccus* possivelmente associadas a bambu (*H. obsoletus*, *H. diops* e *H. flammulatus*), caso seja demonstrado que todos compartilham esta característica. Alternativamente, a Catraca pode revelar-se o único representante dos *Hemitriccus* a ter um ninho assim, o que sugeriria a necessidade de uma reanálise de suas relações filogenéticas. Quanto ao Grimpeirinho, dois ninhos, provavelmente de um mesmo par, foram encontrados em 1997 e 1998 em São Francisco de Paula. O primeiro foi construído em uma cavidade de árvore e o segundo dentro de um crânio bovino pendente. Uma revisão da literatura revela que o Grimpeirinho é mais similar a seus congêneres dos Andes e Cone Sul do continente do que ao simpátrico Grimpeiro (*L. setaria*) quanto à estrutura do ninho e sítio de nidificação. O fato de ambos os ninhos conterem um filhote sugere a postura de um único ovo, o que é atípico em furnariídeos, ou a sobrevivência de apenas um filhote a partir de uma postura maior.

Abstract. – We describe the nests of two endemic passerines of the Atlantic forest, the Brown-breasted

Pygmy-Tyrant (*Hemitriccus obsoletus*, Tyrannidae) and the Striolated Tit-Spinetail (*Leptasthenura striolata*, Furnariidae), based on observations made in Rio Grande do Sul, Brazil. The nest of the pygmy-tyrant was previously unknown, while that of the tit-spinetail is described only briefly in the literature. One nest of the Brown-breasted Pygmy-Tyrant was discovered at Monte Alverne in November 1994. It differed from that of other *Hemitriccus* species in being attached to vertical side stalks of bamboo (*Chusquea* sp.), rather than being pendant. This method of attachment may be unusual. However, if this proves to be the regular nest type for this species, then two alternative interpretations seem plausible. A non-pendant nest may be an advantageous adaptation for nesting in bamboo thickets, and this could be interpreted as a synapomorphy of *Hemitriccus* species putatively associated with bamboo (*H. obsoletus*, *H. diops* and *H. flammulatus*), if all eventually prove to share such a nest type. Alternatively, the Brown-breasted Pygmy-Tyrant may be the only member of the tody-tyrant assemblage to normally have a non-pendant nest, what would suggest the need for a reanalysis of its relationships. In the case of the Striolated Tit-Spinetail, two nests, apparently of the same pair, were found in 1997 and 1998 at São Francisco de Paula. One was in a tree hole and the other was inside a hanging cow skull. The available information indicates that the Striolated Tit-Spinetail is more similar to its congeners of the Andes and southern South America than to the sympatric Araucaria Tit-Spinetail (*L. setaria*) with regard to nest structure and placement. The fact that both nests contained one young suggests a single-egg clutch for the species, a rather unusual clutch-size for a furnariid, or that only one chick survived from a larger clutch. Accepted 8 September 2000.

Key words: *Tyrannidae*, *Furnariidae*, *Hemitriccus obsoletus*, *Leptasthenura striolata*, *Atlantic forest*, *Rio Grande do Sul*, *Brazil*, *nesting*.

Ornithological research carried out by the authors in the state of Rio Grande do Sul, Brazil, over the last ten years has led to the discovery of nests of several species for which no or only little information on nesting behavior was available (Bencke 1995, 1998; Fontana 1997, Fontana *et al.* 2000). Here we report on the nests of the Brown-breasted Pygmy-Tyrant (*Hemitriccus obsoletus*, Tyrannidae) and the Striolated Tit-Spinetail (*Leptasthenura striolata*, Furnariidae), two small suboscine passerines endemic of the Atlantic forest region. The nest of the former was previously undescribed, while that of the latter is described only briefly in the literature.

Brown-breasted Pygmy-Tyrant. Observations on this species were made by GAB near Monte Alverne (29°33'S, 52°20'W), municipality of Santa Cruz do Sul, in central Rio Grande do Sul. Primary forests at this site average about 18–20 m in height, with a few scattered emergent trees [mainly *Myrocarpus frondosus* (Leguminosae) and *Cabralea canjerana* (Meliaceae)] reaching up to 24–27 m. Common trees in

the canopy and middle stratum are *Eugenia rostrifolia* (Myrtaceae), *Trichilia clausenii* (Meliaceae), *Pachystroma longifolium*, and *Alchornea triplinervea* (both Euphorbiaceae), while the understorey is dominated by *Actinostemon concolor* (Euphorbiaceae) and *Sorocea bonplandii* (Moraceae). The undergrowth is fairly open and dominated by terrestrial ferns and saplings. Bamboo (Poaceae) thickets are frequent though never extensive. Two morphological types of bamboo occur. Dwarf bamboos (genus *Chusquea*) have slender, flexible stalks, and form low and tangled thickets (1–2.5 m tall), especially in clearings or along forest edges. The *Merostachys* bamboos have woody and erect stalks and form taller stands (up to about 8 m) that grow primarily where the forest canopy is discontinuous, allowing more light to penetrate into the lower strata of vegetation.

On 10 November 1994, at 10:38 h, a lone Brown-breasted Pygmy-Tyrant was carrying material (mostly bamboo leaves) to an unfinished nest well-concealed amid a c. 1.2-m tall *Chusquea* bamboo thicket on the ridge of a

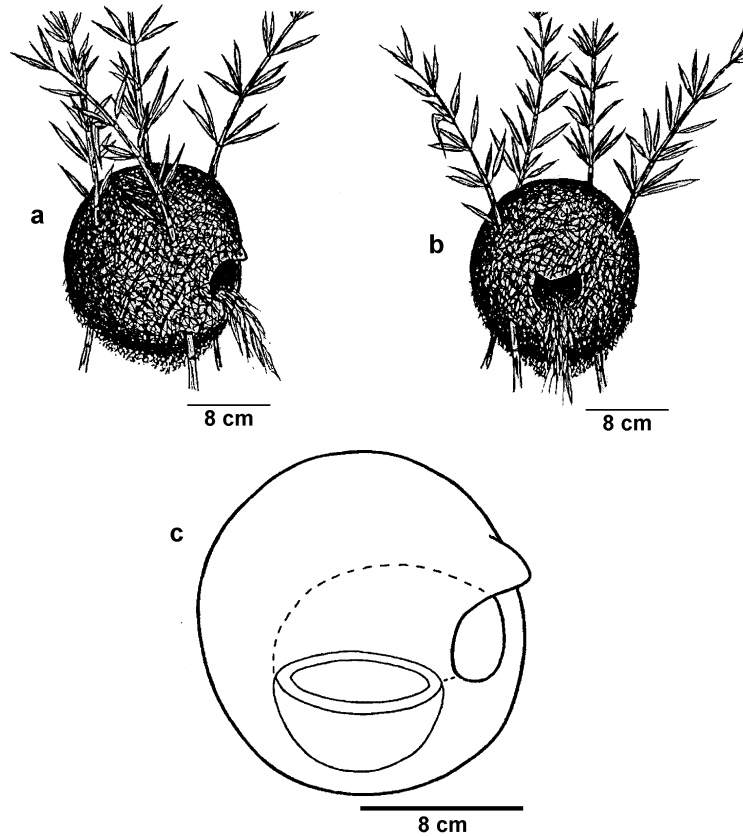


FIG. 1. Nest of the Brown-breasted Pygmy-Tyrant (*Hemitriccus obsoletus*): a) Lateral view; b) Frontal view; c) Schematic structure (drawing by C. M. Joenck).

mount (530 m elevation) covered with primary subtropical forest. On 18 November, the nest had been completed and contained a single egg. On 23 November, an adult was incubating two eggs at 13:22 h while its presumed mate foraged in shrubs and saplings in nearby forest understory. The eggs were white with purplish-vinaceous markings clustered in a ring around the larger end.

The nest was a nearly globular structure composed of a dome-shaped roof and a deep inner cup, with a visor-shaded entrance (Fig. 1). It was attached to vertical side stalks of bamboo at a height of about 0.5 m, with some *Chusquea* leaves projecting out through

its entrance. The nest weighed 11.6 g when dry and measured 17.5 cm high by 16.0 cm wide.

The roof was of green moss (visually the predominant material) and filamentous leaves of *Tillandsia usneoides* (Bromeliaceae), with smaller quantities of black fungal rhizomorphs (genus *Marasmius*). The cup was 8.0 cm in external diameter and 7.0 cm high, and largely was composed of bamboo leaves, with a compact stuffing of plant down in the middle. Other materials present in the cup were fungal rhizomorphs, moss, *Tillandsia* leaves and unidentified plant fibers. The proportions of materials in the nest were as follows

(in percent of total dry weight): *Chusquea* bamboo leaves and stalks, 60.7%; moss (two morphospecies), 22.8%; plant down, 7.2%; *Tillandsia* leaves, 4.5%; fungal rhizomorphs, 1.1%, and other/unidentified, 3.7%.

Although the nest was found unattended on 1 and 7 December, the eggs were still being incubated on 8 December (sitting parent seen at 07:55 h). However, rain storms that lowered the nest and probably cooled the eggs may have interrupted the embryonic development before this, causing the adult to abandon its clutch shortly after.

The small tyrannids collectively known as tody-tyrants (genera *Todirostrum*, *Poecilotriccus*, *Hemitriccus*, *Myiornis*, *Lophotriccus*, *Atalotriccus*, and *Oncostoma*) typically build pendant enclosed nests suspended from the tip of a branch or vine and with a side entrance (see review of Lanyon 1988a and references therein, Sick 1997). At the time of Lanyon's review, nests were known for all genera in his clade and for 18 of the c. 50 species of tody-tyrants. This probably was the main source for the statement by Ridgely & Tudor (1994: 514) that all members of the genus *Hemitriccus* build pendant nests. This notion also is implicit in Sick's (1997: 597) inclusion of *Hemitriccus* among several tyrannid genera that construct "enclosed nests with the shape of a suspended bag" (translated from Portuguese). Notwithstanding, only a few species of *Hemitriccus* appear to have their nests well described in the literature. These include the Hangnest Tody-Tyrant (*H. nidipendulus*) of southeastern Brazil and the Pearly-vented Tody-Tyrant (*H. margaritaceiventris*) of the drier habitats of interior South America (Euler 1900, von Ihering 1900, Hilty & Brown 1986, de la Peña 1987, Narosky & Salvador 1998). In addition, nests are known for the White-eyed (*H. zosterops*) and the Snelthage's (*H. minor*) tody-tyrants of Amazonia, the Buff-breasted Tody-Tyrant (*H. mirandae*) of northeastern Brazil (M. Cohn-Haft, unpubl. data; *in*

lit. 1999), and the Eye-ringed Tody-Tyrant (*H. orbitatus*) of southeastern Brazil (D. Buzzetti, unpubl. data; *in lit.* 1999). All these species indeed build structurally similar pendant nests (at least usually; see below).

The nest of the Brown-breasted Pygmy-Tyrant described above differs from those described for its congeners in being attached to vertical side stalks of bamboo, rather than suspended from a twig or vine, and in its high proportion of bamboo leaves. However, based on only a single nest, we can only speculate as to the evolutionary and ecological significance of its method of attachment. The latter may be unusual and determined by local environmental conditions. The Brown-breasted Pygmy-Tyrant is said to be closely associated with bamboo (Ridgely & Tudor 1994, Parker *et al.* 1996), and bamboo thickets may be preferred nest sites for this species. Pairs whose territories include only dwarf bamboo thickets may face difficulties finding suitable supports for attaching a pendant nest. That *Hemitriccus* nests vary at least exceptionally with regard to the mode of attachment is demonstrated by observations by D. Buzzetti (pers. com.) on the nesting behavior of the Eye-ringed Tody-Tyrant. One of a total of four nests of this species found by him in the state of São Paulo was not pendant. Also, it should be noted that nest characteristics are known to vary in other tyrannids, such as the Yellow-olive Flycatcher (*Tolmomyias sulphureus*) (Sick 1997), Masked Water-Tyrant (*Fluvicola nengeta*) (Pacheco & Simon 1995), and Chocolate-vented Tyrant (*Neoxolmis rufiventris*) (Andors & Vuilleumier 1998).

Nest structure has a long history as a behavioral character used to infer or reveal evolutionary relationships (e.g., von Ihering 1904, Vaurie 1980, Lanyon 1984, 1985, 1988a, 1988b; Andors & Vuilleumier 1998, Zyskowski & Prum 1999), because of its presumed conservative nature. Lanyon (1988a) interpreted a pendant enclosed nest with a

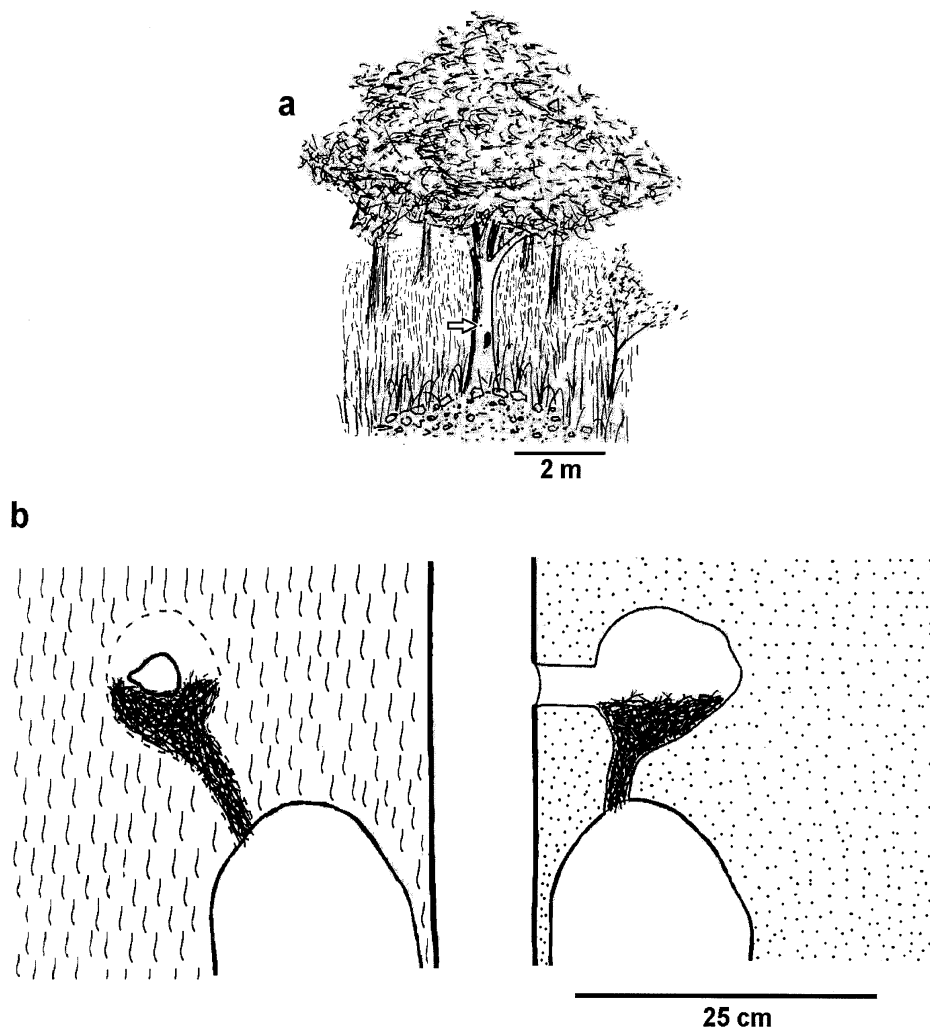


FIG. 2. Nest of the Striolated Tit-Spinetail (*Leptasthenura striolata*) in a tree hole: a) Location; b) Internal structure of the nest hole (schematic): left, frontal view; right, lateral view, also showing the position of the nest inside the hole (drawing by C. M. Joenck).

side entrance as a derived character uniting several genera in his flatbill and tody-tyrant assemblage of tyrant flycatchers: *Rhynchocyclus*, *Tolmomyias*, *Onychorhynchus*, *Platyrinchus* (which does not construct an enclosed nest), *Cnipodectes*, and the tody-tyrants. If the non-pendant nest described here proves to be the regular nest type of the Brown-breasted

Pygmy-Tyrant, then this could have important implications for the systematics of the genus. Until relatively recently, when the genus *Hemitriccus* was broadened to include the variety of tody-tyrants known by that name today (Traylor 1977, 1979), the genus included only the Drab-breasted (*H. diops*), the Brown-breasted, and the Flammulated

(*H. flammulatus*) pygmy-tyrants, based on similarity among them in certain aspects of wing and tail shape (Hellmayr 1927). In recognition of the presumed monophyly of these three species and their apparent preference for bamboo, Ridgely & Tudor (1994) distinguished them from the other tody-tyrants by calling them “bamboo-tyrants”. It can be hypothesized that a non-pendant nest is an advantageous adaptation for nesting in bamboo thickets, and this could be interpreted as a derived character uniting these species if all eventually prove to share such a nest type. The nest of the Flammulated Pygmy-Tyrant remains undescribed. The only published description of the nest of the Drab-breasted Pygmy-Tyrant is by von Ihering (1904), who briefly mentioned having obtained a purse-shaped, pendant nest of this species. However, this information should not be regarded as totally reliable as much of his data on bird nests is second-hand and some has proved incorrect [e.g., his description of the nests of the White-throated Spadebill (*Platyrinchus mystacens*) and Gray-hooded Flycatcher (*Mionectes rufiventris*); Lanyon 1988a, Bencke 1995]. Alternatively, the Brown-breasted Pygmy-Tyrant [or perhaps only the subspecies *H. a. zimmeri*, presumably the form observed, following Traylor (1979)] may emerge as the only member of the tody-tyrant assemblage normally to have a non-pendant nest and this would suggest the need for a reanalysis of its relationships to the other species. For the time being, however, the general biology and nesting behavior of the tody-tyrants still remain poorly known and largely undocumented.

Striolated Tit-Spinetail. The nest of the Striolated Tit-Spinetail was studied by CSF, JKM, and CMJ on the highlands of northeastern Rio Grande do Sul at the Centro de Pesquisas e Conservação da Natureza-Pró-Mata (CPCN), municipality of São Francisco de

Paula. The CPCN (29°27'–29°35'S, 50°08'–50°15'W; 600–970 m elevation) is a 4500-ha private reserve managed by the Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS). This area encompasses expanses of three distinct vegetational formations: upland grasslands, *Araucaria* forest, and Atlantic slope forest. The climate in the region is humid temperate, with yearly rainfall averaging 2250 mm and a mean annual temperature of 14.5°C (Bertoletti & Teixeira 1995). Windy and foggy weather is frequent throughout the year, and the winters are rather cold, with temperature commonly approaching freezing.

Two nests of the Striolated Tit-Spinetail were found one year apart (13 December 1997 and 2 November 1998) at the same location (29°29'S, 50°11'W; 900 m elevation) at the edge of a small wood dominated by trees of the family Myrtaceae. It is reasonable to assume that the same pair occupied both nests, because at any time from late 1997 through early 1999 only one or two Striolated Tit-Spinetails were seen at this site, the nest sites were only 5 m apart, and only one nest was found each year.

In 1997 the nest was placed inside a natural cavity in the trunk of a “guamirim” tree (*Gomidesia palustris*, Myrtaceae) with dbh of 42 cm (Fig. 2). The entrance hole was 1.4 m above the ground, and the cavity contained internally a platform of small sticks and twigs, mixed with moss, and lined with a thin layer of feathers. A single nestling with only a few body and flight feathers erupted was found. The feeding of the young was studied briefly on 15 December between 06:10 and 08:19 h, on a drizzly day. Both adults fed the young and a total of 50 visits to the nest were recorded. Intervals between feeding sessions ranged from a few seconds to a maximum of 11 minutes (mean = 2.32 min, SE = 2.52, mode = 1.0 min, n = 49). Food items brought by the adults were hardly identifiable, but most appeared to be tiny arthropods.

The nest found in 1998, also with a single nestling, was at a height of 1.2 m inside the cranial cavity of a cow skull hanging from a tree trunk. The foramen magnum was used as the nest entrance and measured 4.3 by 4.0 cm. Nest cavity height, from bottom to entrance, was c. 13 cm.

It is interesting to note that in 1998 the Striolated Tit-Spinetails made use of the remains of a nest built by a pair of Southern House-Wren (*Troglodytes musculus*, Troglodytidae) that occupied the same skull in the previous year, when it was fixed c. 10 m away on the veranda of a house situated just outside the wood. The wrens (presumably the same pair), in turn, occupied the tree hole used by the Striolated Tit-Spinetails in 1997. The reasons why these species exchanged nesting sites are unknown, but some competitive interaction between them may have taken place.

Previous reports on the nesting of the Striolated Tit-Spinetail are consistent with the above information. While Sick (1997) only mentions that it nests in holes, Belton (1984) reports two nests found in Rio Grande do Sul, one c. 6 m high in a woodpecker hole excavated on a snag, and another inside a cow skull placed about 1.8 m off the ground. In general, *Leptasthenura* tit-spinetails usually place their nests in cavities in trees, banks, rock-crevices or human constructions, or else in the abandoned nests of other species (Vaurie 1980, Narosky *et al.* 1983, de la Peña 1987, Fjeldsã & Krabbe 1990). A few species build enclosed nests of soft vegetable matter, either regularly [Araucaria Tit-Spinetail (*L. setaria*); Bóçon 1993, Belton 1984] or at least occasionally [Andean (*L. andicola*) and Tawny (*L. yanacensis*) tit-spinetails; Vaurie 1980, Hilty & Brown 1986]. With regard to nest structure and placement, the Striolated Tit-Spinetail is thus more similar to its allopatric congeners of the Andes and southern South America than to the largely sympatric Araucaria Tit-

Spinetail.

Clutch sizes of two to four eggs have been reported for the Tufted (*L. platensis*), Plain-mantled (*L. aegithaloides*), Brown-capped (*L. fuliginiceps*), and Andean tit-spinetails (Narosky *et al.* 1983, Fraga & Narosky 1985, Hilty & Brown 1986, de la Peña 1987). Dorst (1957) mentioned a nest with one young for the Andean Tit-Spinetail. The fact that both nests of the Striolated Tit-Spinetail described above contained only one nestling suggests that the species lays a single egg per clutch, a rather unusual clutch-size for a furnariid (Vaurie 1980, Narosky *et al.* 1983, Stiles & Skutch 1989). Alternatively, only one chick may have survived from a larger clutch of eggs. Belton's (1984: 607) report that "on December 2, 1976 [one] adult fed nestlings" and "nestlings made high-pitched ... sound" implies the presence of more than one chick in a nest of this species. Study of additional nests is necessary to assess the regular clutch size for the Striolated Tit-Spinetail and could eventually reveal whether or not brood size is regulated by environmental conditions in this species.

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