

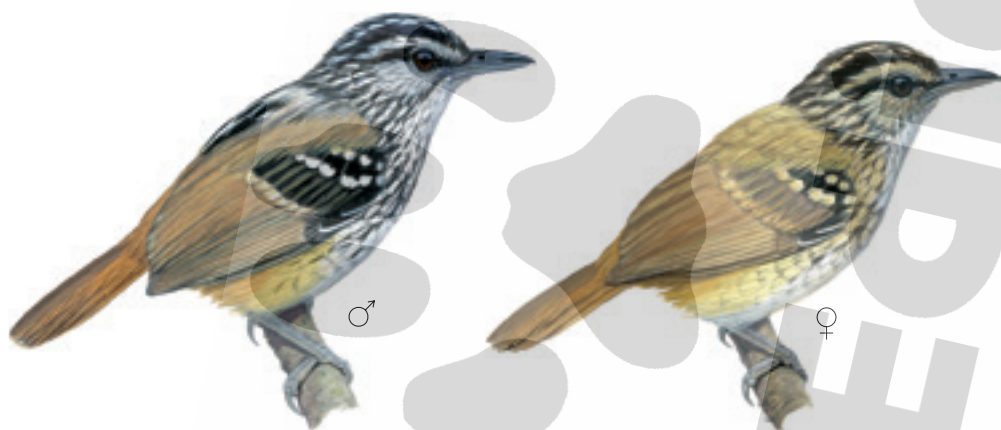
A new species of antbird in the *Hypocnemis cantator* complex from the Aripuanã-Machado interfluvium in central Amazonian Brazil

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In June, 2000, during a brief visit to the town of Manicoré on the right bank of the middle Rio Madeira in Amazonas, Brazil, BMW and MCH were attracted to an unusual vocalization of *Hypocnemis cantator* (Warbling Antbird) that appeared to be homologous to a call commonly heard from other populations across the wide range of the complex. Fieldwork by BMW in July and October, 2001 on the middle and lower Rio Aripuanã and at the mouth of the Rio Roosevelt, and in June, 2002 on the lower Rio Machado (or Ji-Paraná) in Rondônia with MCH defined the distribution of this unique call, restricted to the Aripuanã-Machado interfluvium. The taxonomic study of the *H. cantator* complex presented by Isler *et al.* (2007) confirmed the diagnostic characteristics of this vocalization and mapped its geographical distribution, but did not introduce a name for the population (which was referred to as “*implicata* 2, *taxon novum*”). Collection of fresh specimens of most members of the *H. cantator* complex accompanied by recordings of their songs and calls has permitted DNA-based phylogenetic analyses that corroborate the taxonomic revision proposed by Isler *et al.* (2007) including the significant differentiation of “*implicata* 2”, which we are now prepared to name:

Hypocnemis rondoni Manicore Warbling-Antbird

Cantador-de-rondon (Portuguese)



Holotype.— Museu de Zoologia da Universidade de São Paulo (MZUSP) 92306, adult male from Brazil: Mato Grosso; left bank of the Rio Roosevelt in the Municipality of Colniza (09°07'54"S/60°42'31"W) at about 150 m elevation; collected 5 August 2011 by Fabio Schunck, prepared by Marcelo Félix. Voice recorded by Bret M. Whitney, original numbers BMW 13977-79; Macaulay Library of Natural Sounds (ML) 169980; Isler inventory (ISL) BMW C 0518. Pectoral muscle tissue preserved in approximately 96% alcohol: MZUSP 92306, field number ROO-09.

Diagnosis: Morphology.— As is typical of the several allopecies in the *Hypocnemis cantator* complex, morphological and plumage differentiation is weak. Based on the large series of the *Hypocnemis cantator* complex housed in the collections of MZUSP and the Museu Paraense Emílio Goeldi (MPEG), *H. rondoni* shows, on average, stronger rufous edging on the bases of the rectrices. **Voice.**— The “common call” (*sensu* Isler *et al.* 2007) is immediately distinguishable in the field from those of all other members of the complex and, in spectrographic analysis, by its structure and pace (described below). Male loudsongs are distinguished from those of the closely related *H. ochrogyna* (Rondonia Warbling-Antbird) by three characters; female loudsongs by one (Isler *et al.* 2007). Selected audio files for inter-taxon comparisons, including those used for spectrograms in Isler *et al.* (2007) and this paper, are available for listening

to on the Internet Bird Collection (IBC) website. **Genetic divergence.**— Separated from its sister-species *H. ochrogyna* by approximately 4.2% sequence divergence in the mitochondrial gene ND2 (see *Phylogenetic relationships*, below).

Distribution.— Restricted to central Amazonian Brazil on the right bank of the Rio Madeira in the Aripuanã-Machado interfluvium: from the left bank of the Rio Aripuanã upriver to its confluence with the Rio Roosevelt, from which point upriver it is known only from the left bank of the Roosevelt in the state of Amazonas and extending into northwest Mato Grosso south and west to the right bank of the Rio Machado (or Ji-Paraná) in the state of Rondônia; southern range limits unknown (Fig. 1).

Description of holotype.— See color illustration. Alphanumeric color designations determined through direct comparison with Munsell soil color charts (1994); colors in quotation marks are chart designations. Plumage fresh and unworn, tail and wing not in molt; skull 100% ossified. Forecrown blackish directly over base of bill, becoming whitish to either side to blend with whitish lores. Crown blackish with a pale central stripe imparted by whitish proximal webs on these tiny feathers, appearance of stripe varying toward centralized spot-streaking depending on feather arrangement. Whitish supercilium contrasts with blackish sides of crown and prominent blackish line from lores posterior through eye; auriculars similarly whitish and defined along the lower edge by a uniformly narrow blackish malar streak. Nuchal region blackish irregularly speckled whitish. Mantle and back feathers blackish with whitish proximal and “olive brown” (2.5Y 4/4) distal margins pro-

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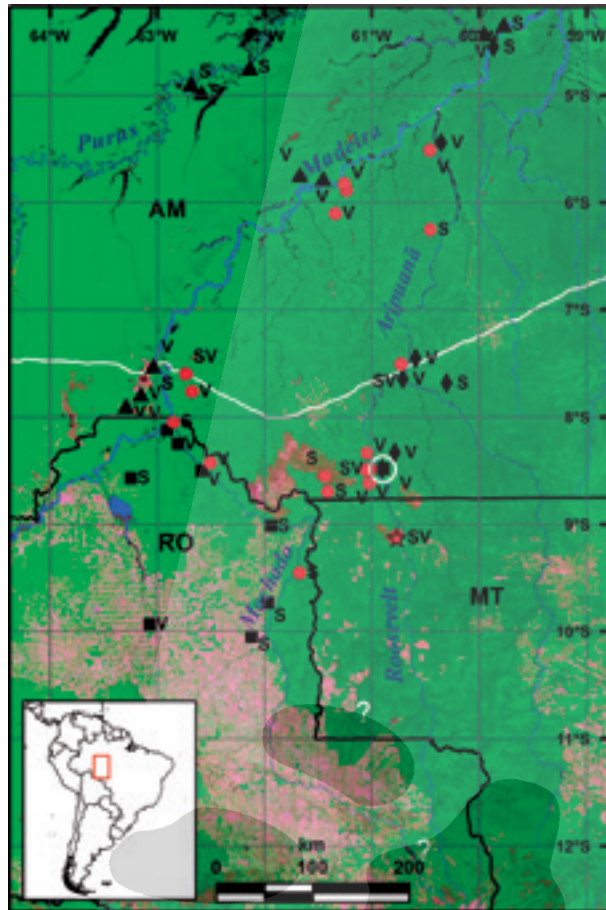
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⁵ Genus *Hypocnemis* 8: 645.

Figure 1. Geographic distribution of taxa in the *Hypocnemis cantator* complex in south-central Amazonian Brazil. Some symbols were shifted slightly from georeferenced locations to permit better clarity of relative positions at this scale (the map is viewable at larger scale in online SI). Red dots = *H. rondoni*. Red star = type locality of *H. rondoni*. Black squares = *H. ochrogyna*. Black triangles = *H. peruviana*. Black diamonds = *H. striata implicata*. The white circle on the right bank of the Rio Roosevelt marks an area from which we have recordings of both *striata* and *ochrogyna*. A white ? indicates areas that have not been inventoried where range limits of taxa need to be determined. Adjacent letters provide documentation: S = specimen; V = vocal recording. Black lines mark the boundaries of Brazilian states as indicated by their official abbreviations: AM = Amazonas; RO = Rondônia; MT = Mato Grosso. The federal highway BR-230 (“Transamazônica”) is shown in white.



ducing an irregularly streaked effect; scapulars more purely “olive brown”. Semi-concealed, white interscapular patch formed by more extensively white feathers underlying central mantle. Lower back without black thus contrasting with mantle, slightly paler than “dark yellowish brown” (10YR 4/6) becoming paler and slightly rustier through rump (nearest 10YR 5/8). Rectrices essentially concolor with lower back, margined with same, slightly rustier hue of rump. Tail weakly graduated, each rectrix marked with a restricted blackish subterminal smudge (nearly obsolete in dorsal aspect) inside a slightly more extensive, 1-mm wide buffy-white tip reduced to minuscule points on central rectrices. Throat whitish with weakly mottled appearance imparted by slightly darker feather tips, this effect abruptly heightened through breastband by more extensive black central stripes of individual feathers increasing in width towards sides of breast. The resulting blotchy pattern changes slightly posteriorly, along the lower edge of the breast/upper belly, as feather webs return to whitish and black marking on individual feathers shifts posteriorly to encompass only a fringe, producing a faintly scalloped effect. Center of belly whitish. Sides and flanks distinctly orangish or rusty, somewhat brighter than “brownish yellow” (10YR 6/8), the anteriormost feathers bearing irregular vestiges of blackish markings described for lower breast; undertail coverts concolor with flanks and unmarked. Lesser upperwing coverts black with discrete white dots encompassing both webs at the feather tip, median coverts blackish tinged olive with slightly larger white tips. Greater coverts nearest “olive brown” (10 YR 2.5 Y 4/4) with a blackish smudge on the distal web anterior to the pale tip, these tips being concentrated on the distal webs and grading from whitish on the outer part of the wing to distinctly buffy or weakly orangish (slightly paler than 10YR 5/8) where they overlie the folded remiges which feathers are finely margined with this same color. Alula deep black with narrow but bold white margin concentrated on distal web; overlying feathers at bend of wing with similar margination concentrated toward the feather tip on both webs. Primary coverts blackish with paler, weakly orangish margins blending with stack of folded primaries. Innermost, overlying secondaries this same color washed very slightly paler at the tips with margins of proximal webs weakly integrated and contrastingly paler (near 10YR 8/4). Underwing coverts white with irregular blackish blotches. **Soft parts in life:** maxilla black, mandible gray; tarsus and feet yellowish-gray; iris brown. **Standard measurements:** total length (just before specimen preparation) 113 mm; bill (culmen from base at skull) 17.1 mm; bill from anterior edge of nares 9.5 mm; bill width at anterior edge of nares 4.4 mm; wing (chord) 52.2 mm; tail 39.9 mm; tarsus 17.7 mm; mass 12.5 g.

Etymology.— Cândido Mariano da Silva Rondon (1865-1958) must have been a truly remarkable person. Among his many ac-

complishments as a leader of men, Rondon worked with Benjamin Constant to articulate the “proclamation of the republic” of Brazil in 1889; he headed the “Brazilian Boundary Inspection Agency” that largely delimited the borders of that vast country as well as the “Strategic Telegraphic Commission” of Mato Grosso that laid more than 7,000 kilometers of telegraph line across remote western Brazil; and he organized and led the famous “Roosevelt-Rondon Expedition” that charted the course of the *rio da Dúvida* (“River of Doubt”) that he then christened the Rio Roosevelt — but we admire him most for his outstanding qualities as a standard-bearer for the well-being and respect of indigenous cultures, founding and for many years directing the *Serviço de Proteção aos Índios* (“Indian Protection Bureau”) which became the modern federal agency *Fundação Nacional do Índio* (FUNAI). Rondon died in Rio de Janeiro at the age of 92. We are privileged to honor *Marechal* Rondon with the name of this distinctive little antbird.

The English name calls attention to the discovery of *H. rondoni* at the old Madeiran town of Manicoré. The correct pronunciation is: *money-co-RAY*, with the accent on the final syllable. We think “Rondon’s Warbling-Antbird” would be confusingly similar to the name of *H. ochrogyna*, Rondonia Warbling-Antbird.

REMARKS

Type series.— The allotype of *Hypocnemis rondoni* is MZUSP 92305, adult female, from the same locality as the holotype. The remaining paratypes of *H. rondoni* are the following fifteen specimens: MZUSP 62284 male (AM, left bank rio Aripuanã at Prainha), 80610 male, 80611 male, 80617 male, and 80615 female (AM, left bank rio Roosevelt at “trilha Esperança”); MPEG 31146 female (AM, left bank rio Aripuanã at the mouth of the rio Guariba), 57661-57665 female, male, male, female, male respectively (AM, Manicoré, “rodovia do estanho” km 126-137); and Instituto Nacional de Pesquisas da Amazônia (INPA) 749 female (AM, left bank rio Aripuanã at rio Arauazinho), 1798 sex unknown (RO, right bank upper rio Machado in Reserva Biológica do Jarú); Louisiana State University Museum of Natural Science (LSUMNS) 182835 male and 182836 female (MT, left bank rio Roosevelt).

Sex for sex, there is minor variation among specimens in the extent (mostly width) of the breastband and pattern of dark markings on individual feathers comprising it, and also in size and extent of pale markings on the crown and wing coverts and width of dark streaking in the mantle, but none of this is pertinent to diagnosability of the taxon.

Ecology and behavior.— *Hypocnemis rondoni*, like other members of the *H. cantator* complex, forages in the understory of *terra firme* forest and joins mixed-species flocks only when these pass through its territory. It does not appear to be associated with any microhabitat variance but tends to occupy borders of light gaps, treefalls, road edges, and other places where sunlight penetrates to the forest understory promoting locally denser vegetative growth. Two stomachs were examined, one of which held insects (Coleoptera and Orthoptera) and one had material too fully digested to identify; stomach contents are preserved at the MZUSP. The nest and eggs of *H. rondoni* remain unknown. High-definition video of *Hypocnemis rondoni* in habitat may be viewed on the IBC website.

Vocalizations.— When compared to common calls of other taxa in the *Hypocnemis cantator* complex (Fig. 2), the common call of *rondoni* is unique (Isler *et al.* 2007). This vocalization ($n = 25$ from localities indicated “V” on Fig. 1; see SI for a list) typically consists of four, less often three or five, notes. The first note is short but usually embellished with overtones, typically rises in frequency, and has a unique, screechy quality. The subsequent two, three, or four short notes are delivered at successively higher frequencies although the final two notes are sometimes at the same frequency. Pace is rapid, the most rapid of any *Hypocnemis* [*cantator*] population, and *rondoni* never ends its call with raspy notes as do some other populations. Principal

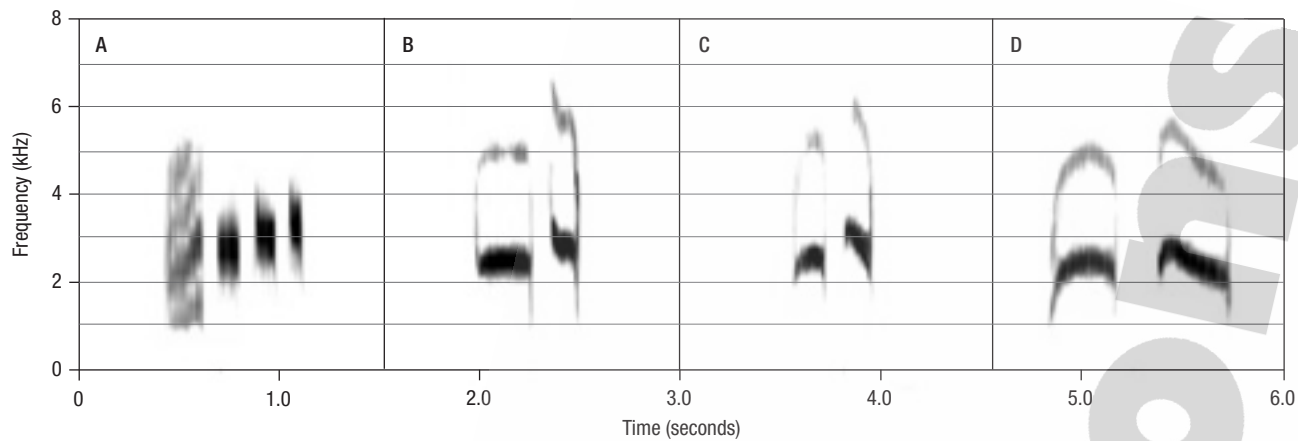
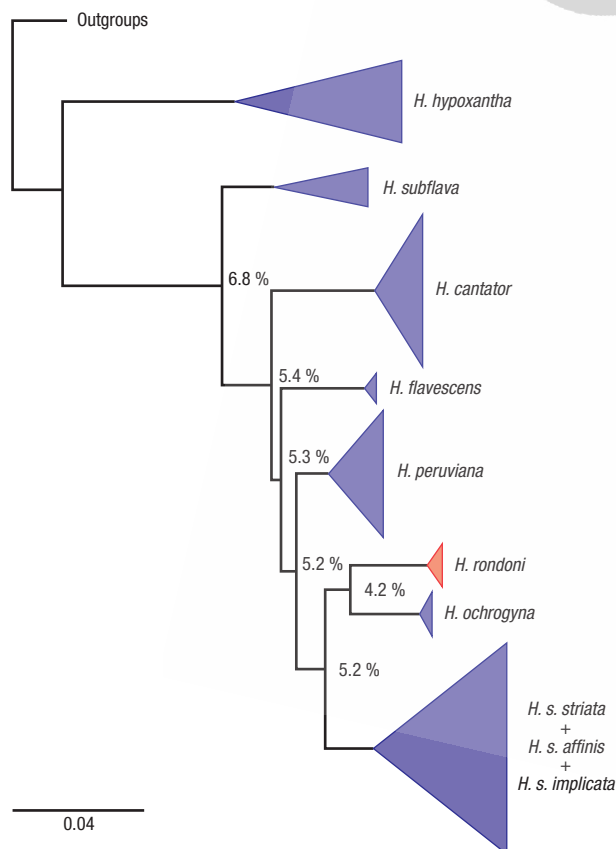


Figure 2. Common calls of taxa in the *Hypocnemis cantator* complex in south-central Amazonian Brazil. (A) *H. rondoni* (holotype MZUSP 92306): Mato Grosso; left bank Rio Roosevelt (ISL: BMW C 0518). (B) *H. striata implicata*: Amazonas; Prainha Nova (ISL: BMW 195 030). (C) *H. ochrogyna*: Rondônia; right bank Rio Machado opposite Palmeiras (ISL: BMW 205 012). (D) *H. peruviana*: Amazonas; 18 km west Humaitá (ISL: BMW 195 020).

variations in *rondoni* calls involve the first note which is sometimes shaped like an inverted “U” and less often twisted into a squiggle. An individual may deliver several variations. For example, in one recording from Nova Olinda on the left bank of the Rio Aripuanã (ISL BMW.200:46), a series of calls begins with a rising first note that gradually changes into an inverted “U” and finally is distorted into a twisted shape. We suspect that observed inter-individual variation in the sound/structure of the first note of the common call relays individual-specific identification information. Isler *et al.* (2007) demonstrated that common calls were important species-level indicators in the *H. cantator* complex.

Although indistinguishable from the neighboring *striata* population to the north, the male and female loudsongs of *rondoni* were found in an earlier study (Isler *et al.* 2007) to differ diagnosably from *ochrogyna*, the population to the south, by three characters and one character respectively and from *peruviana* to the west in an even greater number of vocal characters. Vocal analysis for this study documented loudsong types of both *striata* and *ochrogyna* in close proximity on the right bank of the Rio Roosevelt (Fig. 1, symbols circled). Whether this interesting situation reflects sympatry of two species or perhaps introgression between them remains a (fascinating!) subject for further research.



Phylogenetic relationships.— DNA sequence data for the mitochondrial gene NADH subunit 2 (ND2, 1041 base pairs) were obtained for 63 individuals in the genus *Hypocnemis* from scattered locations across its distribution, representing the seven currently recognized species (see SI for a list of ingroup and outgroup taxa). Phylogenies by maximum-likelihood and Bayesian inference methods (see details in SI) were largely consistent with a previous species-level phylogenetic hypothesis of the genus *Hypocnemis* (Tobias *et al.* 2008; Fig. 3). We identified, however, three well-supported lineages south of the Amazon and east of the Madeira instead of two: *H. striata*, *H. ochrogyna*, and *H. rondoni*. The latter two represent genetically distinctive groups that replace each other across the Aripuanã/Roosevelt and Machado rivers and are more closely related to each other than they are to any other lineage in the genus. These results confirm that *H. striata* (*sensu* Isler *et al.* 2007) is paraphyletic; additional observed genetic structure within it remains unresolved and awaits further analysis of a denser and appropriately geographically distributed sample. For the time being, at least, we recommend maintaining *implicata* and *affinis* as subspecies.

Conservation.— *Hypocnemis rondoni* has the most restricted global population of any member of the *H. cantator* complex and a smaller population than most currently recognized species of Amazonian birds, but it is not currently threatened by anthropogenic alteration of its habitat or other sources. Of great concern, however, is the fragmentation and outright destruction of forest in the narrow headwaters region of the Machado, Roosevelt, and Aripuanã rivers, which is mostly unprotected, and some of these watersheds will soon be altered drastically by installation of massive hydroelectric dams. Unless this area is adequately sampled very soon, we stand to lose much critical information on the processes involved in the differentiation of Amazonian birds in general and the dynamics of secondary contact in particular.

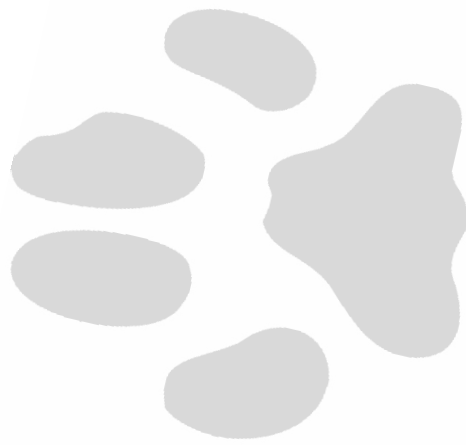
Acknowledgments.— Our sincere thanks to Waner Costa of “Pousada Rio Roosevelt” in southern Amazonas state for his hospitality to MZUSP personnel and permission to make important collections of birds on both banks of the river there in September 2007. Marcelo Félix of MZUSP did an excellent job of specimen preparation in Mato Grosso with BMW and FS in August 2011. Thanks to the Fundação de Amparo à Pesquisa no Estado de São Paulo (FAPESP) and Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for the concession of grants (Evolução da Fauna de Vertebrados Terrestres Brasileiros do Cretáceo ao Presente: Paleontologia e Filogenia, CNPq 565046/2010-1), fellowships (LFS and VQP) and for the authorization for collecting and Research by Foreigners and also to the Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA – SISBIO) for collecting permits. We are grateful to Robb T. Brumfield and Donna L. Dittmann at LSUMNS for allowing access to tissue samples under their care, and to Ingrid Macedo of INPA and Alexandre Aleixo and Fátima Lima of MPEG for help with specimens under their care. Molecular work was supported by grants to

Figure 3. Maximum-likelihood tree topology of the genus *Hypocnemis* showing that *H. rondoni* is sister to *H. ochrogyna* and that this pair is sister to the as-yet unresolved *H. striata* complex. All resolved nodes have bootstrap support values >70 and posterior probability values >0.95.

GAB from the Frank Chapman Memorial Fund – AMNH, the American Ornithologists' Union, the LSUMNS Big Day Fund, LSU Biograds, and NSF (DEB-1011435). We are grateful to NASA for free and open access to the MODIS (EOSDIS) satellite imagery used to produce the map image. Gabriel Biffi of the Entomology Department of the MZUSP graciously helped us by identifying arthropod stomach contents. Phyllis Isler kindly prepared the spectrograms. Richard Banks and Thomas Schulenberg provided helpful comments on the manuscript. Hilary Burn painted the figures of *H. rondoni* that accompany this description.

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