

The *Lispinus* ERICHSON, 1840 species of Ecuador with description of a new species and a new synonymy (Coleoptera: Staphylinidae: Osoriinae)

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Abstract

Lispinus bellavistae sp.n. (Coleoptera: Staphylinidae: Osoriinae) is described from Ecuador. All species of *Lispinus* ERICHSON recorded from Ecuador are presented and a key to the species of the genus is provided. *Lispinus neotropicus* IRMLER, 1994 is synonymised with *L. catena* SHARP, 1876. The ecology and geographical distribution of the Ecuadorian *Lispinus* species are discussed.

Key words: Coleoptera, Staphylinidae, Osoriinae, *Lispinus*, Neotropical Region, new species, new synonymy, key, geographical distribution, Ecuador.

Introduction

During a field trip to Ecuador for collecting Osoriinae in 2009, a new species of the genus *Lispinus* ERICHSON was found in the area of the Bellavista Cloud Forest Station at approximately 2300 m elevation. The discovery of the new species provided the motivation to summarize the knowledge of the Ecuadorean species of the genus.

The genus *Lispinus* occurs world-wide in tropical and subtropical regions, but a modern review is needed for most continents as the genera *Nacaeus* BLACKWELDER, 1942, *Tannea* BLACKWELDER, 1952, *Liberiana* BLACKWELDER, 1942 and others were included in the genus by HERMAN (2001). Together with *Neolosus* BLACKWELDER, 1942, *Liberiana*, and *Lispinuncus* IRMLER, 2005 they are forming the subtribe Lispinina of the tribe Thoracophorini (IRMLER 2010). No autapomorphic characters have been found for this subtribe, but with the exception of *Tannea* all genera have a hook-like ductus in the spermatheca and characteristic setation of head and pronotum. With the exception of the genus *Lispinuncus*, obviously endemic to Ecuador, all genera show a world wide distribution.

Including the new species, 54 species of the genus *Lispinus* are currently known from the Neotropical Region. One of these will, however, be synonymized in this paper. Fifteen species contribute to the Ecuadorian fauna. Beside the description of the new species, this study lists the records of the genus from Ecuador, provides a key to the species, and discusses the ecology and distribution of all known Neotropical species.

Material and Methods

Material of the following museums and private collections was studied:

AMNH	American Museum of Natural History, New York, USA
BMNH	Natural History Museum, London, United Kingdom
CNCI	Canadian National Collection of Insects, Ottawa, Canada
FMNH	Field Museum of Natural History, Chicago, USA

JC	private collection of J. Janák, Rtyň nad Bílinou, Czech Rep.
KNHM	Kansas Natural History Museum, Snow Entomological Collections, Lawrence, Kansas, USA
NMP	National Museum of Czech Republic, Prague, Czech Rep.
UIC	private collection of Ulrich Irmeler, Plön, Germany
VAC	private collection of Volker Assing, Hannover, Germany

For the measurement of total length, the inter-segmental space of abdominal segments was considered. The lengths of individual tagmata were determined along the midline, their widths at the widest part. For the photographs of the species, a Makroskop M 420 (Wild Herbrugg) was used in combination with a digital camera (Leica EC3). CombineZ5 (HADLEY 2006) was used to achieve depth of field.

Lispinus bellavistae n.sp.

Holotype ♂: Ecuador: Bellavista (78°42'40"W, 0°01'58"S), near Nanegalito, cloud forest reserve, under bark, 2300 m, 2.8.2009, U. Irmeler (UIC). **Paratypes**: 3 ♂♂, 5 ♀♀, with same data as holotype (UIC, AMNH); 1 ♂, same location, but at fallen twigs, 31.7.2009, leg. U. Irmeler (UIC).

DESCRIPTION (Figs. 1a–h, 7): Length: 5.2–5.7 mm. Colour: black, legs and antennae reddish. Head: 0.70 mm long, 0.90 mm wide; sides from posterior edge of eyes to anterior edge of frons and anterior edge of clypeus margined; slightly emarginate in central part; punctuation dense and moderately deep; distance between punctures on average shorter than diameter of punctures; distance between two larger setiferous punctures between eyes 1.5 times as wide as distance between eyes and punctures; another pair of setiferous punctures between posterior edge of eyes and neck; a pair of supraocular setiferous punctures and two pairs of setiferous punctures in front margin of clypeus; microsculpture weak, partly net-like, partly longitudinally reticulate; surface slightly shiny. Antennae slightly shorter than head and pronotum combined; 2nd antennomere oblong, narrower and shorter than 3rd; antennomeres 4 and 5 slightly longer than wide; following antennomeres more or less quadrate. Pronotum: 0.80 mm long, 1.00 mm wide; widest in anterior third; nearly straightly narrowed to posterior angles and shortly narrowed to anterior angles; sides margined; in dorsal aspect lateral margin not visible in anterior forth; punctuation similar as on head; a fine and sparse micro-punctuation between normal punctures; with irregular impunctate midline; front edge and lateral margin with several setae differing in length; depressions in posterior angles weak; net-like microsculpture weak; surface slightly shiny. Elytra: 1.20 mm long, 1.15 mm wide; with slightly longitudinal punctures; punctuation as deep and dense as on pronotum; three larger setiferous punctures in a longitudinal row between suture and lateral margin; irregular row of setae in lateral margin; setae differing in length; net-like microsculpture denser and deeper than on pronotum; surface matt. Abdomen with deep and dense punctuation; much denser than on fore-body; laterally with dark setae. Aedeagus with slender paramera; membranous part narrow; endophallus with three torsions. Spermatheca with more or less straight ductus; behind sclerotized funnel part curved and transparent.

DIAGNOSIS: This species is certainly related to the *L. insularis*-group that includes *L. insularis* CHEVROLAT & FAUVEL, 1863, *L. listenbarthi* IRMLER, 1994, and *L. venezuelanus* IRMLER, 2000 concerning the structure of the spermatheca and the overall habitus. Within this group, *L. bellavistae* mostly resembles *L. venezuelanus* in size, punctuation and microsculpture. *Lispinus bellavistae* is distinctly larger than all other species of the group. *Lispinus venezuelanus* is slightly smaller (5.4 mm long). Both species can be clearly differentiated by the structure of the aedeagus. Paramera more slender in *L. bellavistae* and endophallus has fewer torsions.

ETYMOLOGY: The specific name is derived from the location in Ecuador, the Cloud Forest Reserve, where it was found.

Records of *Lispinus* species from Ecuador

Lispinus attenuatus ERICHSON, 1840 (Figs. 2a, 4a, 5a, 7)

Lispinus attenuatus ERICHSON 1840: 828

Lispinus apicalis SHARP 1876: 413

Material examined: Sucumbios: Panacocha (76°04.16'W, 0°26.58'S), Sacha Lodge, Malaise trap, 270 m, 3 exs., 25.07.1994, leg. P. Hibbs (KNHM); Pastaza: Santa Clara (77°52'W, 01°18'S), 1 ex., 27.11.2004, leg. P. Banar (JC); Orellana: Yasuni E. Scientifica (76°24'W, 0°40'S), 4 exs., 20.4.2011, leg. J. Torres (VAC).

Lispinus bolivianus BERNHAUER, 1929 (Figs. 2b, 4b, 5b, 7)

Lispinus bolivianus BERNHAUER 1929: 346

Lispinus opacipennis BERNHAUER 1921: 66

Material examined: Pastaza: without more information to the locality, 1 ex. (FMNH); Santa Clara (77°52'W, 01°18'S), 1 ex., 27.11.2004, leg. P. Banar (JC).

Lispinus catena SHARP, 1876 (Figs. 2c, 4c, 5c, d)

Lispinus catena SHARP 1876: 412

Lispinus boxi BLACKWELDER 1943: 293

Lispinus neotropicus IRMLER 1994: 66 **syn.n.**

Material examined: Pichincha: Rio Palenque, 47 km S Santo Domingo de los Colorados (79°19'W, 00°28'S), leaf litter, 56 exs., 28.02.1976, leg. J.M. Campbell (CNCI); Reventador, 15 km SW (77°39.14'W, 0°03.40'S), under bark of log, 30 exs., 28.10.1988, leg. L. Herman (AMNH, UIC); Rio Napo: Tena (77°49'W, 00°59'S), leaf litter, 3600 m, 2 exs., 03.05.1982, leg. H. Frania (FMNH); Limoncocha (76°37'W, 00°24'S), 270 m, 1 ex., 16.03.1976, leg. J.M. Campbell (CNCI); 6.9 km E Puerto Napo, primary forest with sparse understory, shady, leaf litter, rotten branches along trail (77°43.58'W, 1°01.48'S), sifted, 500 m, 1 ex., 24.11.2006, leg. Fikáček (NMP); Guamani, 33 km N Tena, 8–29 km E Loreto Road (77°36.53'W, 0°42.48'S), under bark of log, 1400 m, 1 ex., 2.11.1988, leg. L. Herman (AMNH); Sucumbios: Panacocha (76°04.16'W, 0°26.58'S), Sacha Lodge, 270 m, 1 ex., 24.05.1999, leg. R.W. Brooks (KNHM); Pastaza: Santa Clara (77°52'W, 01°18'S), 1000 m, 7 exs., 27.11.2004, leg. P. Banar (JC); Santa Clara (77°52'W, 01°18'S), Otoyaku N.R., 1 ex., 8.8.2011 (VAC); 1.6 km SEE Santa Clara, dense lowland forest vegetation on bank of stony river, shaded, leaf litter (77°52.32'W, 1°16.17'S), sifted, 660 m, 1 ex., 17.11.2006, Fikáček (NMP).

REMARKS: The species shows a sexual dimorphism in the shape of its pronotum. The sides of the male pronotum are more or less evenly narrowed from front angle to posterior angle, whereas the pronotum of the female is more smoothly curved. Furthermore, the variance in the striate linear depression of the elytra is largely ranging from a distinct deep line to a number of large deep striate punctures. The large number of specimens available showed that the characters originally used for the differentiation of *L. catena* and *L. neotropicus* are within the range of *L. catena*. Therefore, *L. neotropicus* is synonymised with *L. catena*.

Lispinus cordilliensis IRMLER, 1994 (Figs. 3n, 4m, 6n, 7)

Lispinus cordilliensis IRMLER 1994: 68

Material examined: Cotopaxi: San Francisco de las Pampas (78°57.59'W, 0°26.25'S), rotting logs, 1400 m, 1 ex., 12.01.1992, leg. R. Leschen (KNHM); Pichincha: 19 km NW Nono (78°38.02'W, 0°02.47'S), 2700 m, 1 ex., 01.03.1976, leg. J.M. Campbell (CNCI); Rio Napo: Puerto Napo (77°43'W, 01°02'S), 1 ex., 06.06.1982, H. Frania (CNCI).

Lispinus fungicola IRMLER, 2001 (Figs. 2d, 4d, 5e, 7)

Lispinus fungicola IRMLER 2001: 4

Material examined: Pichincha: Rio Palenque, 47 km S Santo Domingo de los Colorados (79°19'W, 00°28'S), 1 ex., 28.02.1976, leg. J.M. Campbell (CNCI); Nanegalito (78°41.08'W, 0°00.32'N), 45 km NW Quito, 1600 m, 1 ex., 20.12.1991, leg. R. Leschen (UIC); Maquipucuna Forest Reserve, 50 km NW Quito, epiphyte (78°41.05'W, 0°03.11'N), Berlese extraction, 1350 m, 1 ex., 20.12.1991, leg. C.E. Carlton (KNHM).

Lispinus granadensis* FAUVEL, 1865** (Figs. 2e, 4e, 5f, 7)*Lispinus granadensis* FAUVEL 1865: 52**Material examined:** Sucumbios: Panacocha (76°04.16'W, 0°26.58'S), Sacha Lodge, Malaise trap, 1 ex., 03.04.1994, P. Hibbs (KNHM).Lispinus laeviusculus* BERNHAUER & SCHUBERT, 1910** (Figs. 2f, 4f, 5g, 7)*Lispinus laeviusculus* BERNHAUER & SCHUBERT 1910: 22*Lispinus laevigatus* BERNHAUER 1906: 193**Material examined:** Pichincha: 45 km NW Quito (78°40'W, 0°03'N), 1600 m, 2 exs., 14.04.1990, leg. C.E. Carlton (KNHM); Rio Palenque, 47 km S Santo Domingo de los Colorados (79°19'W, 0°28'S), leaf litter, 2 exs., 28.05.1975, leg. J. Peck (CNCI); Tinalandia (79°03.39'W, 0°16.53'S), 800 m, 1 ex., 28.03.1999, leg. R.W. Brooks (KNHM); Sucumbios: Panacocha (76°04.16'W, 0°26.58'S), Sacha Lodge, Malaise trap, 2 exs., 25.07.1994, P. Hibbs (KNHM, UIC); Rio Napo: Limoncocha (76°37'W, 0°24'S), 270 m, 4 exs., 16.03.1976, leg. J.M. Campbell (CNCI); Puerto Misahualli (77°39.54'W, 1°02.06'S), 400 m, 2 exs., 02.06.1982, leg. H. Frania (CNCI); Yuturi Lodge (76°02.18'W, 0°32.54'S), under bark, 270 m, 3 exs., 21.03.1999, leg. R.W. Brooks (KNHM, UIC).***Lispinus linearis* ERICHSON, 1840** (Figs. 2g, 4g, 5h)*Lispinus linearis* ERICHSON 1840: 829; IRMLER 2009 (distribution map)*Lispinus punctatus* SHARP 1876: 414*Lispinus cognatus* SHARP 1876: 415*Lispinus modestus* SHARP 1876: 415*Lispinus planus* SHARP 1876: 416*Lispinus aremicus* BLACKWELDER 1943: 131**Material examined:** Pastaza: without further information on the locality, 1 ex., 01.05.1931, leg. B. Malkin (FMNH); Santa Clara (77°52'W, 01°18'S), 1000 m, 13 exs., 27.11.2004, leg. P. Banar (JC, UIC); Santa Clara (77°52'W, 01°18'S), near Puyo, 950 m, 3 exs., 21.7.2008, leg. W. Rossi (VAC); Sucumbios: Panacocha (76°04.16'W, 0°26.58'S), Sacha Lodge, Malaise trap, 270 m, 1 ex., 23.06.1994, leg. P. Hibbs (UIC); Sacha Lodge (76°27.35'W, 0°28.14'S), 270 m, under bark, 1 ex., 24.03.1999, leg. R.W. Brooks (KNHM); San Antonio (76°39'W, 0°17'S), 4 exs., 04.12.2004, leg. P. Banar (JC, UIC); Rio Napo: Tena (77°49'W, 0°59'S), under bark, fallen tree, 2000 m, 2 exs., 06.05.1982, leg. H. Frania (CNCI); Archidona, 4.1 km W, dense secondary forest margin, nr. banks of muddy stream, wet leaf litter (77°50.40'W, 0°54.37'S), sifted, 670 m, 7 exs., 9.11.2006, leg. Fikáček (NMP).***Lispinus listenbarthi* IRMLER, 1994** (Figs. 2h, 4h, 6i, 7)*Lispinus listenbarthi* IRMLER 1994: 66**Material examined:** Sucumbios: Panacocha (76°04.16'W, 0°26.58'S), Sacha Lodge, Malaise trap, 270 m, 3 exs., 26.08.1994, leg. P. Hibbs (KNHM, UIC); Pastaza: Santa Clara (77°52'W, 01°18'S), 9 exs., 27.11.2004, leg. P. Banar (JC, UIC).***Lispinus quadripunctulus* FAUVEL, 1865** (Figs. 2i, 4i, 6j)*Lispinus quadripunctulus* FAUVEL 1865: 49; IRMLER 2009 (distribution map)*Lispinus terminalis* SHARP 1876: 413**Material examined:** Pastaza: Santa Clara (77°52'W, 01°18'S), 1000 m, 8 exs., 27.11.2004, leg. P. Banar (JC, UIC); Morona Santiago: Puerto Morona, Rio Cusuimi (77°37'W, 2°47'S), without further information (FMNH).***Lispinus sinuatoollis* BERNHAUER, 1942** (Figs. 3j, 4j, 6k)*Lispinus sinuatoollis* BERNHAUER 1942: 2; IRMLER 2009 (distribution map)*Lispinus costaricensis* IRMLER 1994: 64**Material examined:** Pichincha: 45 km NW Quito (78°40'W, 0°03'S), 1600 m, 1 ex., 14.04.1990, leg. C.E. Carlton (KNHM); Rio Napo: Oriente, Joya de los Sachos (76°47'W, 0°26'S), under bark, 1 ex., 23.12.1981, leg. L. Karpela (BMNH); Morona Santiago: Puerto Morona, Rio Cusuimi (77°37'W, 2°47'S), without further information (FMNH).

Lispinus sobrinus* FAUVEL, 1865** (Figs. 3m, 6o, 7)*Lispinus sobrinus* FAUVEL 1865: 47*Lispinus analis* IRMLER 1994: 60**Material examined:** Rio Napo: Puerto Napo, rain forest, 2 exs., 03.01.1976, leg. J.M. Campbell (CNCI).Lispinus striola* ERICHSON, 1840** (Figs. 3k, 4k, 6l, 7)*Lispinus striola* ERICHSON 1840: 829**Material examined:** Pichincha: Río Palenque, 47 km S Santo Domingo de los Colorados (79°19'W, 00°28'S), leaf litter, 1 ex., 28.02.1976, leg. J.M. Campbell (CNCI); Sucumbios: Panacocha (76°04.16'W, 0°26.58'S), Sacha Lodge, Malaise trap, 1 ex., 25.07.1994, leg. P. Hibbs (CNCI); Shushufindi (76°38'W, 0°11'S), 300 m, 5 exs., 08.12.2004, leg. P. Banar, (JC, UIC); San Antonio (76°39'W, 0°17'S), 33 exs., 4.12.2004, leg. P. Banar (JC, UIC); Rio Napo: Oriente, Joya de los Sachos (76°47'W, 0°26'S), under bark, 1 ex., 23.12.1981, leg. L. Karpela (BMNH); Pastaza: under bark, 1 ex., 15.05.1971, leg. B. Malkin (FMNH); Santa Clara (77°52'W, 01°18'S), near Puyo, 2 exs., 21.7.2008, leg. W. Rossi (VAC); Morona Santiago: Puerto Morona Río Cusuimi (77°37'W, 2°47'S), without further information (FMNH).***Lispinus tardinus* IRMLER, 1994** (Figs. 3l, 4l, 6m, 7)*Lispinus tardinus* IRMLER 1994: 67**Material examined:** Pichincha: 45 km NW Quito, 1600 m, 1 ex., 14.04.1990, leg. C.E. Carlton (KNHM); Río Palenque, 47 km S Santo Domingo de los Colorados, (79°19'W, 00°28'S), leaf litter, 2 exs., 28.02.1976, leg. J.M. Campbell (CNCI); Sucumbios: Panacocha (76°04.16'W, 0°26.58'S), Sacha Lodge, Malaise trap, 270 m, 1 ex., 25.07.1994, leg. P. Hibbs (KNHM).**Key to *Lispinus* species of Ecuador**

The key mainly uses characters that can be seen without preparation of the aedeagus, but a sure identification is only achieved, if the aedeagus is dissected. Moreover, the spermatheca also provides important information for the identification.

- 1 Body length smaller than 3.4 mm 2
- Body length larger than 3.4 mm 3
- 2 Depressions at posterior pronotal angles distinct and with denser microsculpture than on disc; surface matt; depressions separated from lateral margin; transparent lobe at inner branch of paramera elongate; 2.8–3.2 mm *L. bolivianus* BERNHAUER, 1929
- Depressions at posterior pronotal angles distinct, but with same weak microsculpture as on disc; surface shiny; depressions not separated from lateral margin; transparent lobe of paramera not elongate; 2.9–3.3 mm *L. granadensis* FAUVEL, 1865
- 3 Elytra with continuous lateral stria; at least with row of striate punctures forming a nearly continuous stria 4
- Elytra without continuous lateral stria or with row of striate punctures 5
- 4 Sides of pronotum more or less parallel; in posterior half a slight emargination, but at posterior angles as wide as at anterior angles; surface of elytra with iridescent shine; endophallus of aedeagus with several torsions and hook-like structures; paramera Y-shaped with transparent lobe on inner branch; spermatheca with spiraled ductus, 3.9–4.3 mm *L. striola* ERICHSON, 1840
- Sides of pronotum narrowed to posterior angles; with sexually dimorphic shape; in males more triangular than in females; surface of elytra shiny without iridescence; endophallus of aedeagus with several torsions and specific W-like structure; transparent lobe of paramera shortly acute, spermatheca with straight ductus; 3.7–4.3 mm *L. catena* SHARP, 1876

- 5 Abdominal tergites laterally with diagonal striae; fore body with coarse and dense punctation; surface slightly shiny; paramera of aedeagus with narrow inner transparent lobe; 3.5–3.8 mm *L. linearis* ERICHSON, 1840
- Abdominal tergites without diagonal striae; fore-body in some species with dense, but sparser and finer punctation, or species much longer 6
- 6 Sides of pronotum parallel or nearly parallel 7
- Pronotum distinctly narrowed to posterior angles; in most species with distinct or slight emargination in front of posterior angles 9
- 7 Punctuation of fore body, and particularly elytral punctuation, very sparse and weak; microsculpture fine and dense; elytra with iridescent shine; paramera of aedeagus trilobed; inner branch transparent; ductus of spermatheca straight, 4.1–4.5 mm *L. laeviusculus* BERNHAUER & SCHUBERT, 1910
- Punctuation of fore body denser and deeper; microsculpture coarser; net-like reticulate; surface shiny, but without iridescence; paramera of aedeagus bilobed; ductus of spermatheca undulate 8
- 8 Pronotum slightly narrowed to posterior angles; microsculpture of elytra weaker net-like; surface slightly shiny; the two large setiferous punctures on each side of suture distinctly larger than normal punctuation; 3rd antennomere only 1.5 times as long as 2nd; transparent lobe of paramera slightly elongate; 4.5–5.0 mm *L. quadripunctulus* FAUVEL, 1865
- Pronotum parallel; with slight emargination in front of posterior angles, but at posterior angles as wide as at anterior angles; microsculpture of elytra distinct; surface matt; 3rd antennomere two times as long as 2nd; transparent lobe of paramera triangular; 4.1–4.6 mm *L. attenuatus* ERICHSON, 1840
- 9 Body length at least 5.2 mm 10
- Body length smaller than 5.2 mm 11
- 10 5.5–6.0 mm long; elytra slightly longer than wide and with dense and laterally coriaceous punctuation; microsculpture of elytra isodiametric; endophallus with three torsions *L. sobrinus* FAUVEL, 1865
- 5.2–5.7 mm long; elytra quadrate; with dense, but not coriaceous punctuation; microsculpture of elytra elongate; endophallus with two torsions *L. bellavistae* IRMLER, 2012
- 11 Pronotum slightly emarginate in front of posterior angles; pronotum and elytra with weak; more or less longitudinal microsculpture; surface shiny 12
- Pronotum evenly narrowed to posterior angles; at least elytra with dense longitudinal or net-like microsculpture; surface matt 13
- 12 Length 4.8–5.2 mm; elytra 1.2 times as wide as pronotum; antennae longer than head and half of pronotum combined; endophallus of aedeagus with two torsions and elongate parallel apical structures *L. cordilliensis* IRMLER, 1994
- Length, 3.7–4.3 mm; elytra not wider than pronotum; antennae as long as head and half of pronotum combined; endophallus of aedeagus with numerous torsions and a hook-like apical structure *L. sinuatocollis* BERNHAUER, 1942
- 13 Elytra with net-like microsculpture; paramera Y-shaped; 4.1–4.6 mm *L. tardinus* IRMLER, 1994
- Elytra with more or less longitudinal microsculpture; paramera not Y-shaped 14
- 14 On average slightly smaller; 3.7–3.9 mm; pronotum widest close to middle; microsculpture of elytra dense and with slight iridescent shine; spermatheca with spiraled ductus *L. fungicola* IRMLER, 2001
- On average slightly longer; 3.8–4.3 mm; pronotum widest close to anterior angles; microsculpture of elytra still denser and with distinct iridescent shine; spermatheca with elongate ductus *L. listenbarthi* IRMLER, 1994

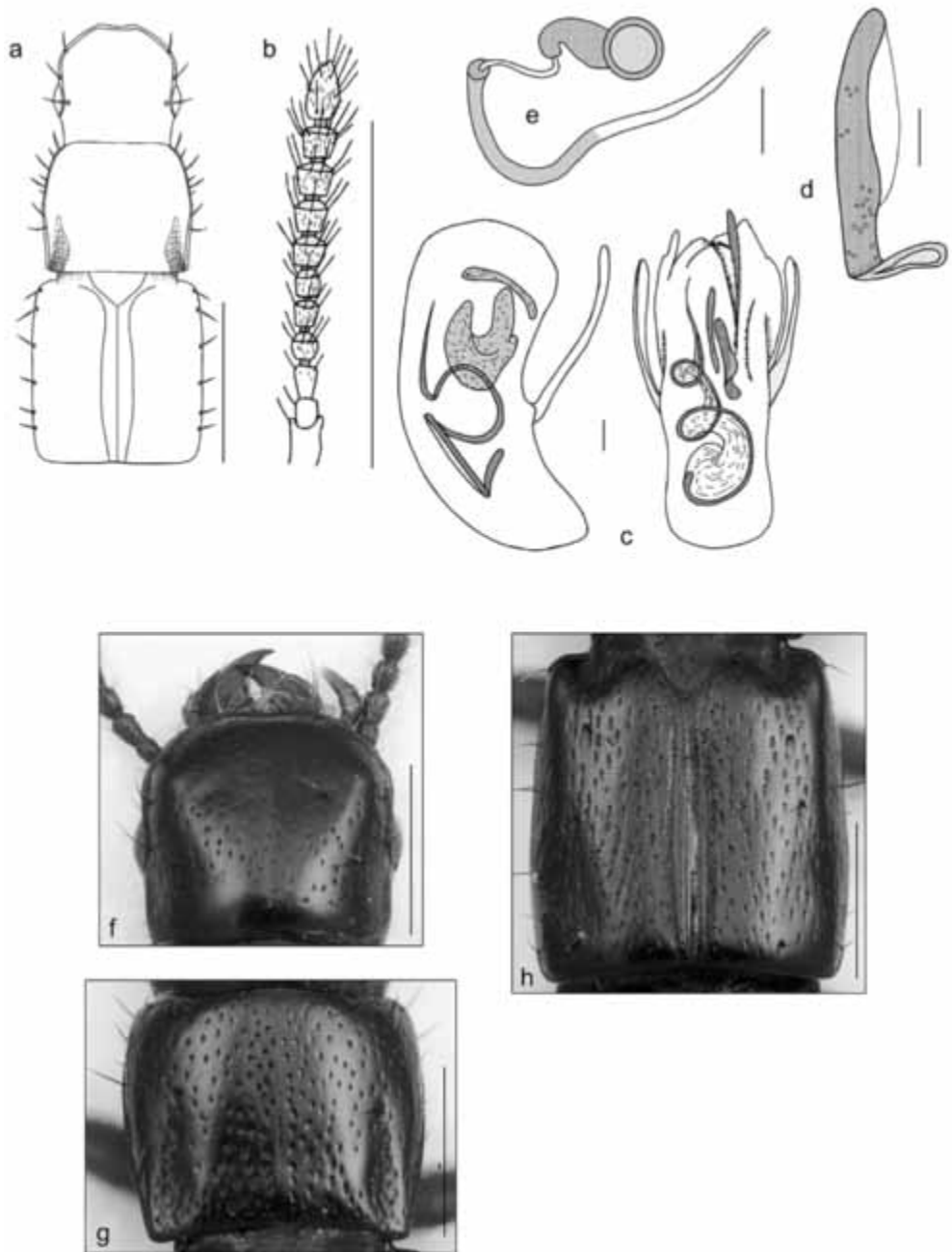


Fig. 1: *Lispinus bellavistae*: forebody (a), antenna (a), aedeagus in lateral and dorsal aspect (c), paramera (d), spermatheca (e), punctation and microsculpture of head (f), pronotum (g), and elytra (h); scale bar: a–b: 1 mm, c–e: 0.1 mm, f–h: 0.5 mm.

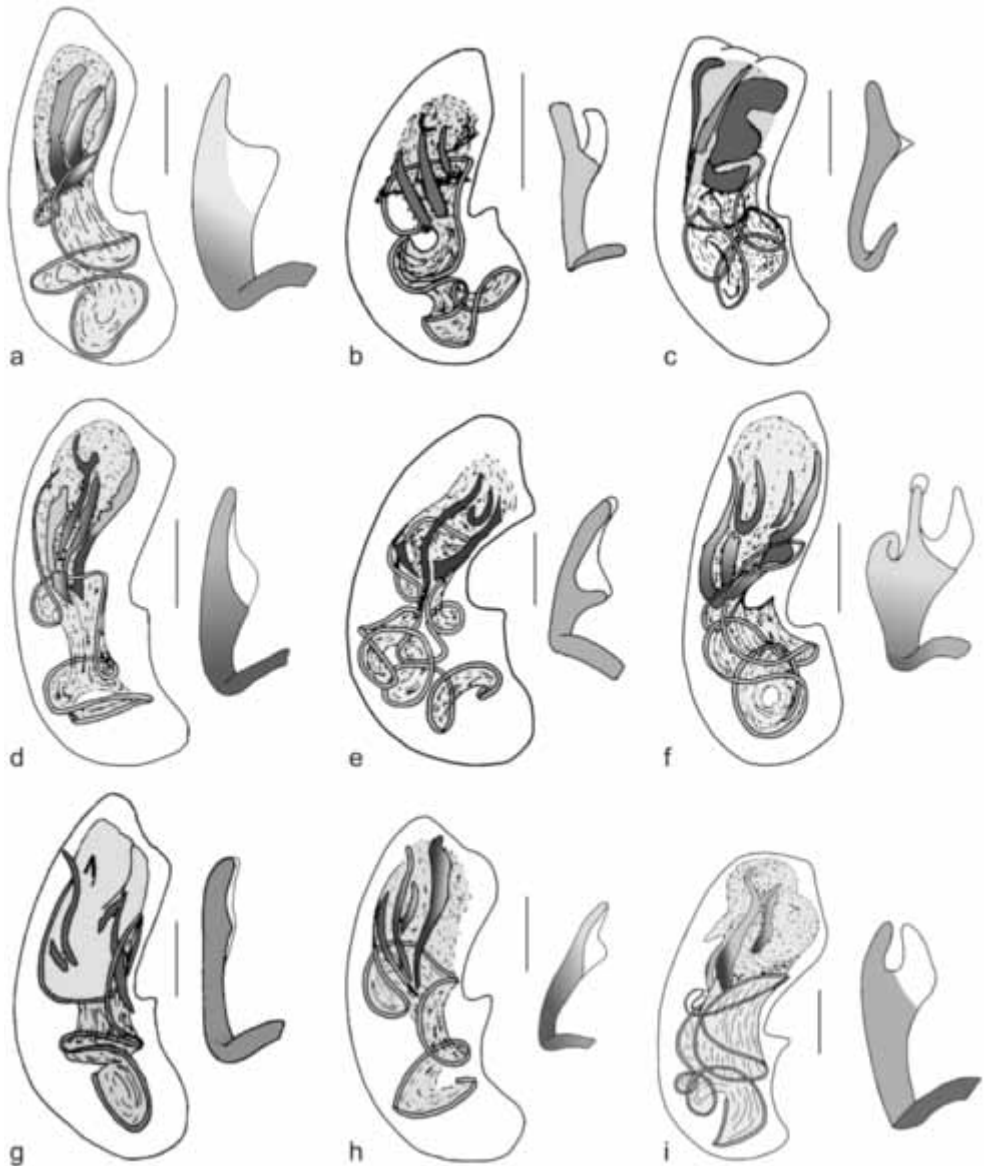


Fig. 2: Aedeagus (left) and paramera (right) in lateral aspect of *Lispinus attenuatus* (a), *L. bolivianus* (b), *L. catena* (c), *L. fungicola* (d), *L. granadensis* (e), *L. laeviusculus* (f), *L. linearis* (g), *L. listenbarthi* (h), *L. quadripunctulus* (i); scale bar: 0.1 mm.



Fig. 3: Aedeagus and paramera in lateral aspect of *Lispinus sinuatocollis* (j), *L. striola* (k), *L. tardinus* (l), *L. sobrinus* (m), *L. cordilliensis* (n); scale bar: 0.1 mm.

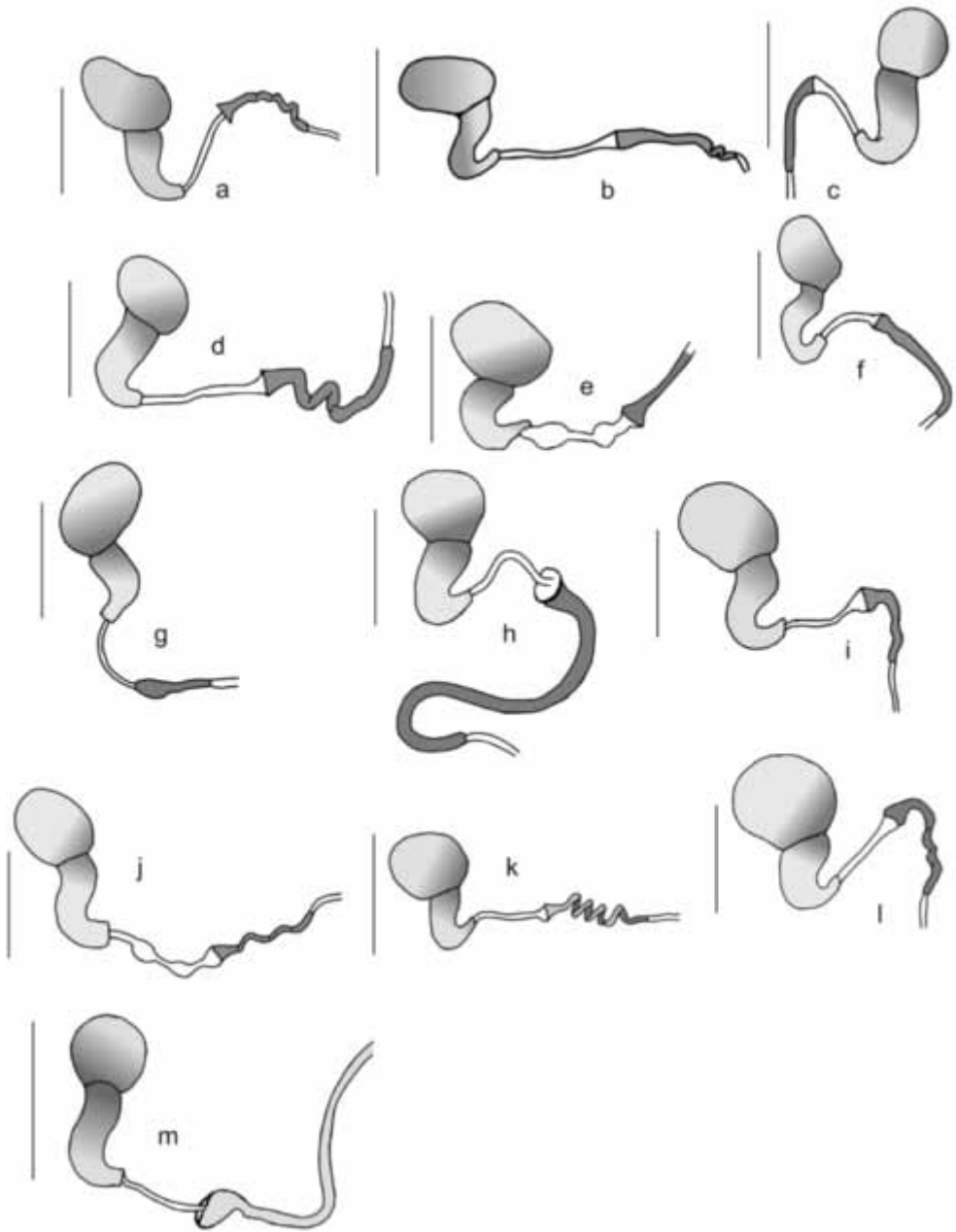


Fig. 4: Spermatheca in lateral aspect of *Lispinus attenuatus* (a), *L. bolivianus* (b), *L. catena* (c), *L. fungicola* (d), *L. granadensis* (e), *L. laeviusculus* (f), *L. linearis* (g), *L. listenbarthi* (h), *L. quadripunctulus* (i), *L. sinuatocollis* (j), *L. striola* (k), *L. tardinus* (l), *L. cordilliensis* (m); scale bar: 0.1 mm.

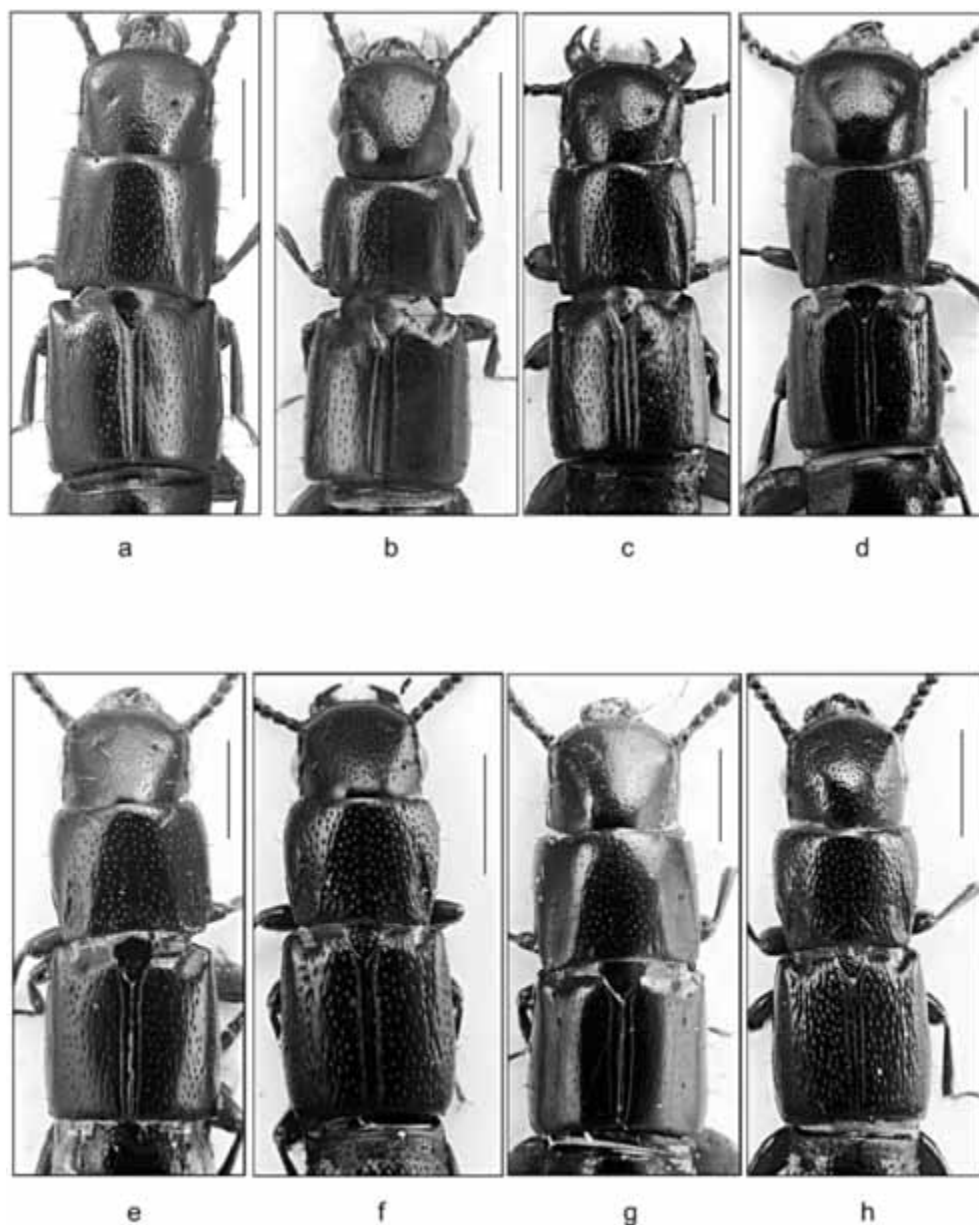


Fig. 5: Fore-body of *Lispinus attenuatus* (a), *L. bolivianus* (b), *L. catena* female (c), *L. catena* male (d), *L. fungicola* (e), *L. granadensis* (f), *L. laeviusculus* (g), *L. linearis* (h); scale bar: 0.5 mm.

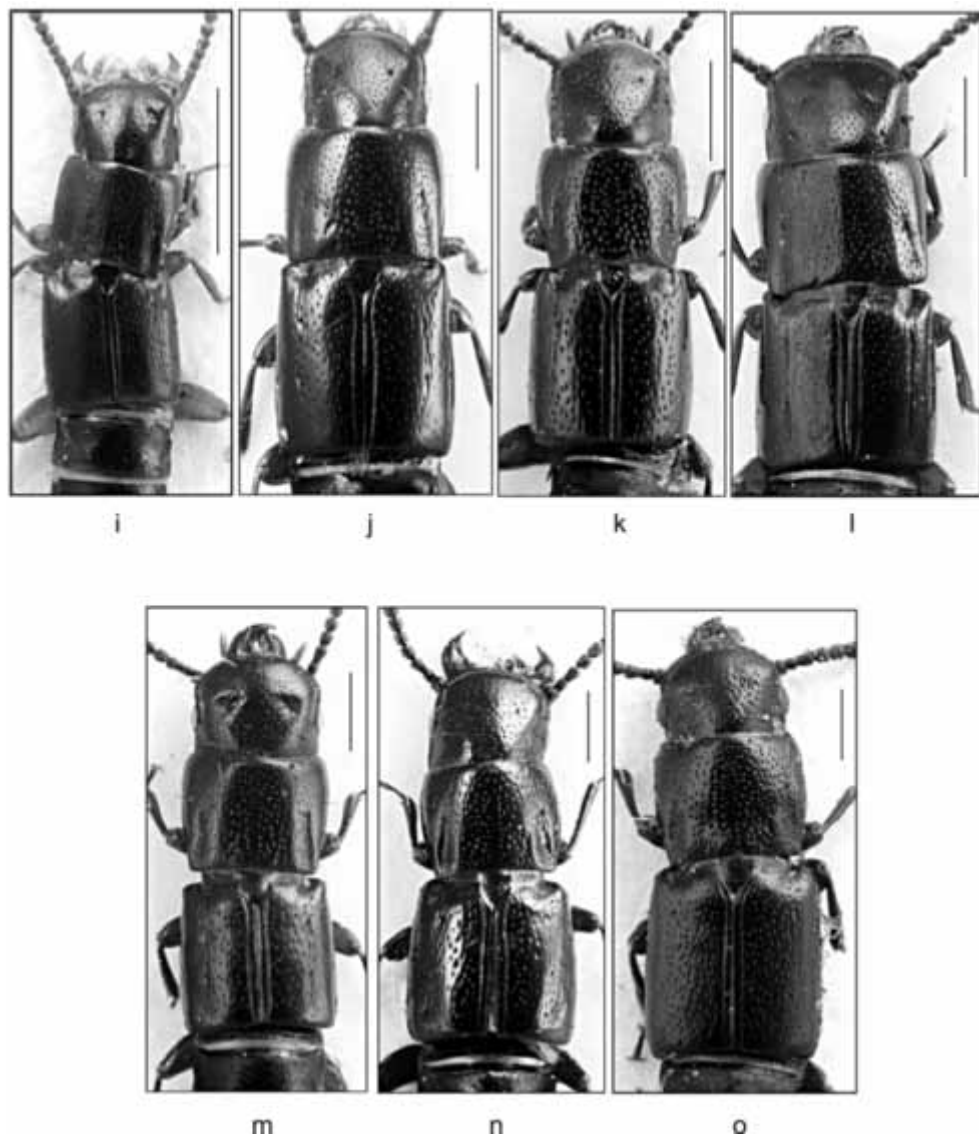


Fig. 6: Fore-body of *Lispinus listenbarthi* (i), *L. quadripunctulus* (j), *L. sinuatocollis* (k), *L. striola* (l), *L. tardinus* (m), *L. cordilliensis* (n), *L. sobrinus* (o); scale bar: 0.5 mm.

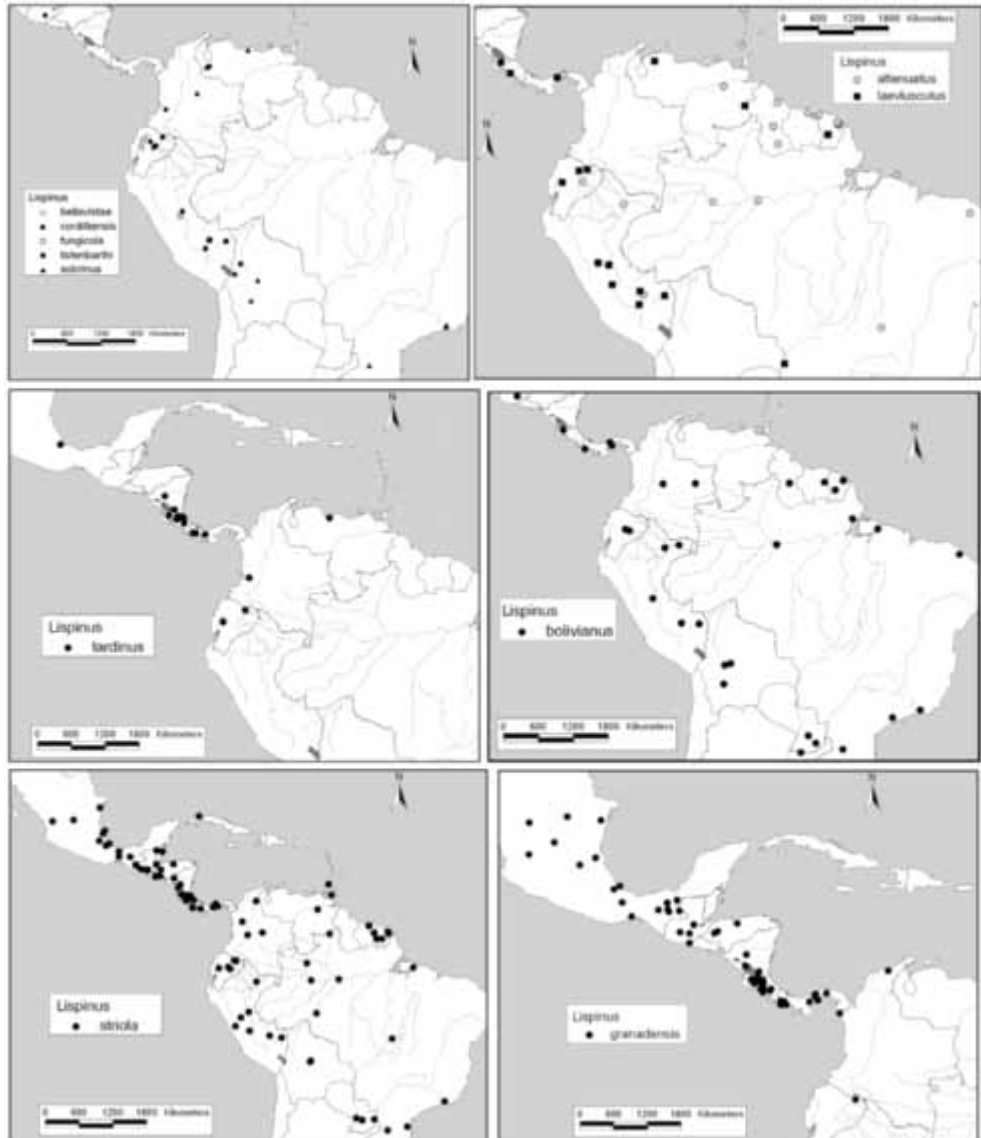


Fig. 7: Geographical distribution of *Lispinus* species found in Ecuador.

Discussion and remarks on zoogeographic compartments

According to investigations in Costa Rica, *Lispinus* species are mainly living under bark of logs (IRMLER 2006). My own observations in Ecuador referring to the sampling of the new species *L. bellavistae* support this preference of the subcortical habitat. The majority of specimens were found under bark of rotting logs and only one specimen was found by sifting twig litter containing lichens. The subcortical habitat was characterised by the occurrence of a large number of passalid beetles forming engravings in the phloem filled with fed bark. The *Lispinus* species lived under the more fixed parts of the bark together with species of the genus *Leptochirus* GERMAR. Fifteen of the specimens of *Lispinus* from Ecuador analysed for this study, had information about the habitat. Among these, nine and six specimens are labelled bark or rotting log and generally litter, respectively. A study of the Peruvian *Lispinus* species also resulted in the subcortical habitat as being the preferred habitat of *Lispinus* (IRMLER 2009).

In contrast to the study of the Peruvian *Lispinus* fauna that revealed no species at elevations higher than 2000 m (IRMLER 2009), the Costa Rican study recorded two species between 2000 and 2300 m elevation (IRMLER 2006). Thus, the location of the new species *L. bellavistae* at 2300 m elevation seems to be at the upper limit of altitudes for *Lispinus* species. Overall, for 13 Ecuadorian species information to the altitude of the sampling locations were available. One species, *Lispinus striola*, was recorded at a maximum elevation of 300 m, six species at a maximum elevation of 1000 m, four species at a maximum elevation of 1600 m, and two species at more than 2000 m elevation. With an altitude of the sampling location at 2700 m, *L. cordilliensis* was the second species found at such high elevations. The preference of *L. striola* for lowland rainforest habitats was already stressed by IRMLER (2006) for the Costa Rican fauna. While *L. laeviusculus* and *L. tardinus* were found in Ecuador at a maximum of 1600 m elevation, their maximum elevation in Costa Rica was at 1000 m.

In Peru, species of the genus *Lispinus* were found exclusively on the eastern slope of the Andean range (IRMLER 2009). In contrast, *Lispinus* species were collected on the western and the eastern slope in Ecuador. However, the eastern slope showed a more diverse fauna. Among the 15 Ecuadorian *Lispinus* species, six species were found only on the eastern Andean slope and two species including the new one only on the western slope. Fifteen species were found on both slopes. The obvious difference to the Peruvian situation can be explained by the higher rainfall on the western Andean slope in Ecuador with the development of large cloud forests.

Overall, most *Lispinus* species recorded from Ecuador are widely distributed in the Neotropics (Fig. 7). Up to now, only the new *L. bellavistae* is recorded exclusively from Ecuador. Two species, *L. fungicola* and *L. listenbarthi*, seem to be restricted to the Andean range from Ecuador to Peru and in the case of *L. listenbarthi* also to Bolivia. *Lispinus cordilliensis* and *L. sobrinus* show a similar but wider distribution, from Venezuela to Bolivia and in *L. sobrinus* still to southern Brazil. Three species, *L. attenuatus*, *L. sinuatocollis*, and *L. tardinus* are recorded from northern South-America and Central America. As in *L. attenuatus* they may also occur on the southern West Indian islands. *Lispinus granadensis* seems to be mainly occurring in Central America. Its record from northern Ecuador is the southernmost location found up to now. Another large group with *L. laeviusculus*, *L. quadripunctulus*, *L. bolivianus*, *L. catena*, and *L. striola* is found all over the tropical and subtropical zones from Mexico to Brazil. Only *L. laeviusculus* and *L. quadripunctulus* seem to avoid the Amazonian lowland rainforests. Thus, Ecuador seems to be poor in endemic *Lispinus* species compared to adjacent Peru, where five species are presumably endemic (IRMLER 2009).

Zusammenfassung

Lispinus bellavistae sp.n. aus Ecuador wird beschrieben. Alle bisher bekannten Nachweise von *Lispinus* Arten aus Equador werden aufgeführt und ein Bestimmungsschlüssel der Arten präsentiert. *Lispinus neotropicus* IRMLER, 1994 wird mit *L. catena* SHARP, 1876 synonymisiert. Die Ökologie und geographische Verbreitung der *Lispinus* Arten von Equador wird diskutiert.

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