

**Data on the genus *Adelopsis* from Ecuador.
Description of five new species
(Coleoptera Leiodidae Cholevinae Ptomaphagini)**

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Abstract

The genus *Adelopsis* Portevin, 1907, contains 51 species of Neotropical Ptomaphagini, of which only *A. sciaky* Zoia, 1992 and *Adelopsis* sp. (PECK, 1984-1985) were cited from Ecuador. Five new species are described in this paper: *Adelopsis tuberculata* sp. n., *A. onorei* sp. n., *A. dehiscentis* sp. n., *A. ecuatoriana* sp. n. and *A. bioforestae* sp. n. All species have been determined by a combination of characters in the shape of the aedeagus, genital segment and spermatheca. The position of each species is discussed and data on different aspects of their biology are given.

Keywords: Coleoptera, Leiodidae, Cholevinae, Ptomaphagini, *Adelopsis*, Taxonomy, new species, Ecuador.

Introduction

Very few studies have mentioned the Leiodids from Ecuador. Until now, the only references made were by SZYMCAKOWSKI (1961, 1968), PECK (1984-1985), ZOIA (1992), PECK *et al.*, (1998), PERREAU (2000) and SALGADO (2001). This paper provides new complete information on another 5 species from Ecuador belonging to the genus *Adelopsis* PORTEVIN, 1907, as *Adelopsis sciaky* ZOIA, 1992 is not an *Adelopsis* but a *Ptomaphagus*, as indicated by GNASPINI (1996). The only definite report on the presence of *Adelopsis* in Ecuador was by PECK (1984-1985), but the species was not defined.

Materials and Methods

The specimens used in this study belong to the collection of the Pontificia Universidad Católica de Quito, Ecuador (QCAZ-Museum). To dissect the

genitalia, the specimens were relaxed by being boiled in water. Some structures with much adhered tissue were cleaned for a few minutes (10-15 minutes) in hot 10% KOH. The dissected genitalia were mounted in a small rectangular piece of plastic in a drop of "Hoyer liquid".

The holotypes or paratypes of the species studied are deposited in the following collections: Pontificia Universidad Católica de Quito, Ecuador (QCAZ-Museum); Field Museum of Natural History, Chicago, USA (FMNH); Dr. P.M. Giachino, Museo Regionale di Scienze Naturali, Torino, Italy; Dr. J.M. Salgado, Departamento de Biología Animal, Universidad de León, Spain.

Systematics

We follow the suprageneric classification proposed by NEWTON & THAYER (1992), NEWTON (1998) and PECK, GNASPINI & NEWTON, 1998.

Family Leiodidae FLEMING, 1821
Subfamily Cholevinae KIRBY, 1837
Tribe Ptomaphagini JEANNEL, 1911
Genus *Adelopsis* PORTEVIN, 1907

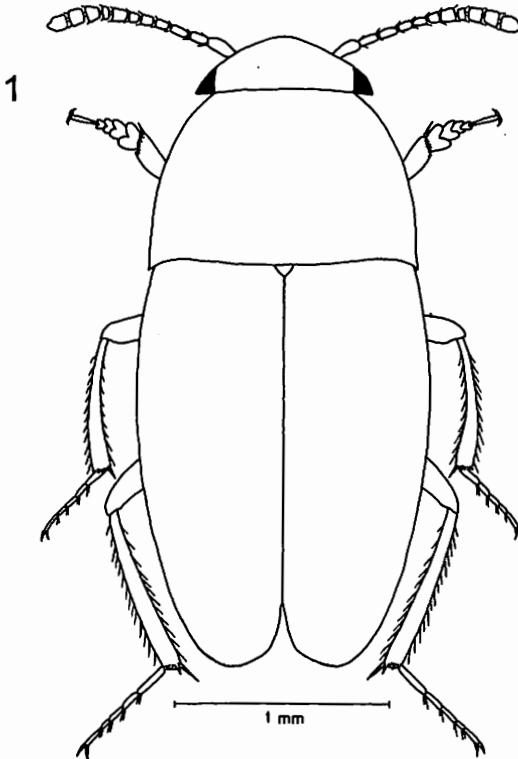


Fig. 1. Habitus of *Adelopsis bioforestae* sp. n.

Adelopsis tuberculata sp. n.
(Figs 2-9)

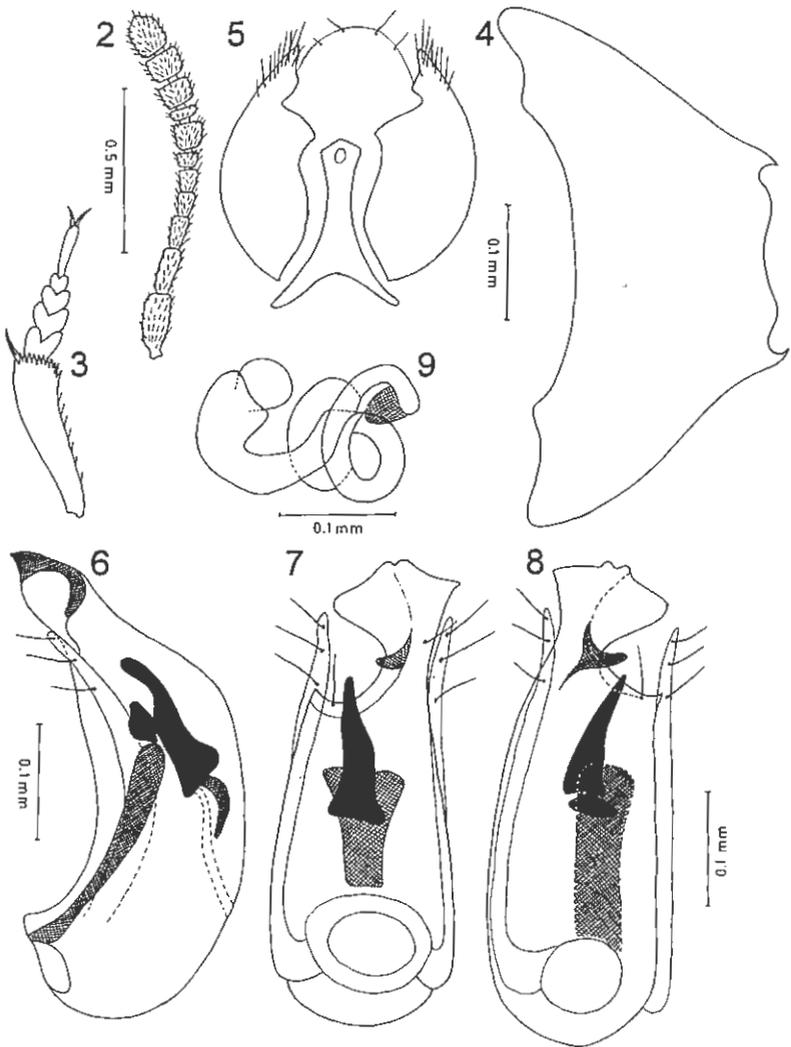
Holotype (male), description. Body length: 2.23 mm. Paratypes: 2.10-2.32 mm. Winged. Oval-shaped, elongate body. Color dark reddish brown; tip of last antennal segment pale. Pubescence short, golden, fine and prostrate. Head bearing very finely marked striolae. Eyes well developed.

Antennae short, 1.34 times as long as pronotum, not passing base of pronotum when laid back (Fig. 2); 1st and 2nd segments with weakly defined lateral keels, in dorso-lateral view; they are the longest, the 1st being slightly longer and clearly wider than the 2nd; 11th one and a half times longer than 10th; 6th, 8th, 9th and 10th segments transverse, 7th almost transverse and 8th twice as wide as long; using the length of the 9th segment as a basis, relative length of each segment from 1st to 11th: 1.81, 1.79, 1.27, 0.82, 0.82, 0.63, 1.04, 0.54, 1.00, 1.00, 1.52; ratios of length to width of each segment, respectively: 1.98, 2.73, 2.12, 1.41, 1.35, 0.92, 1.02, 0.49, 0.82, 0.83, 1.41.

Pronotum large, convex, 1.66 times as wide as long, slightly more narrow than elytra; sides rounded anteriorly, maximum width in posterior 1/4, which has almost parallel lateral margins; pronotal surface shiny, covered in fairly strong separated striolae. Elytra oval, weakly convex, together 1.35 times as long as wide and 2.41 times as long as length of pronotum; tips slightly rounded; striolae fairly strong, weakly oblique and as separated as those on pronotum. Carina of mesosternum elevated, rounded in lateral view. Anterior tibiae expanded at tip; protarsi expanded, with first tarsomere 0.88 times as wide as the maximum width of tibia; 1st and 2nd tarsomeres of equal width, 3rd slightly narrower (Fig. 3). 6th ventrite with anterior and posterior margins slightly lobulate, lateral regions pointed, tips facing inwards (Fig. 4). Genital segment globular as long as wide, lateral lobes with numerous apical setae, ventral spiculum gastrale with long slightly widened anterior region, posterior region widely divided in short branches (Fig. 5).

Aedeagus with basal orifice almost ventral, two and a half times longer than wide (Fig. 6); right lobe strongly developed, forming a large rhomboid plate in the final region, with two small tubercles in mid apical region, as well as a ventral seta towards the lower lateral margin and a small tooth in the strongly sclerotized basal internal region (Fig. 7). Left lobe formed by a small protuberance. Large apical orifice, somewhat oval-shaped, with seta in lower margin. Parameres shorter than right lobe, with end region separated from the aedeagus and facing outwards, with 3 well-developed setae, clearly separated from each other. Inner sac with flagellum short, weakly curved and strong, robust sclerotized area distinguishable on base (Fig. 8).

Female. Anterior (distal) region of spermatheca wide and long, bearing apical lobe slightly narrower than final region in which it is inserted; posterior (basal) region with three turns, well-sclerotized structure at beginning resembling tongue and adhered to dorsal face of copulatory sac (Fig. 9).



Figs 2-9. *Adelopsis tuberculata* sp. n. 2, antenna; 3, protarsus and tibia; 4, 6th ventrite; 5, genital segment; 6-8, aedeagus, lateral, ventral and dorsal view; 9, spermatheca.

Type material: HOLOTYPE, ♂. Ecuador: Napo, Archidona, Lagarto Cave, 850 m, 00° 49' 55"S - 79° 46' 79"W, 16-I-1999, QCAZ Coll., F. Ayala leg.

PARATYPES. Ecuador: Napo, Archidona, Lagarto Cave, 850 m, 00° 49' 55"S - 79° 46' 79"W, 16-I-1999, 2♂-2♀, FMNH Chicago Coll., 2♂-1♀, Giachino Coll., 1♂-1♀, Salgado Coll., 4♂-5♀, QCAZ Coll., F. Ayala and Olmedo leg.; Napo, Archidona, Lagarto Cave, 850 m, 00° 49' 33"S - 76° 46' 47"W, 2-XI-1998, 1♂-1♀, QCAZ Coll., M. Avila & F. Sáenz leg.; Napo, Archidona, Cacique Cave, 750 m, 00° 54' 13"S - 77° 48' 09"W, 13-I-2001, 1♂-1♀, QCAZ Coll., J. Rodríguez leg.; Napo, Archidona, Kamatoa Cave, 750 m, 00° 54' 55"S - 77°

46° 38'W, 13-I-2001, 2♂, QCAZ Coll., J. Rodríguez leg.; 10-XII-2000, 1♂-1♀, Salgado Coll., 1♂-1♀, QCAZ Coll., P. Piedrahita leg.; 20-I-2001, 1♂, QCAZ Coll., F. Villamarín leg.; Napo, Archidona, Piñautu Cave, 780 m, 00° 50' 54"S - 77° 46' 73"W, 16-I-1999, 1♂-1♀, QCAZ Coll., D. Paucar leg.; Napo, Tena, Jumandi Cave, 750 m, 00° 53' 18"S - 77° 47' 49"W, 27-XII-1998, 1♂, QCAZ Coll., A. Lara leg.

Discussion. The general shape of the aedeagus of *Adelopsis tuberculata* sp. n. is somewhat similar to that of *Adelopsis triangulifera* SZYM CZAKOWSKI, 1961, *A. peruviana* BLAS 1980, *A. sinuosa* GNASPINI & PECK, 1996, *A. coronaria* GNASPINI & PECK, 1996, *A. leticia* GNASPINI & PECK, 2001 and *A. palata* GNASPINI & PECK, 2001. However, the differences in the shape of the right lobe and apical region of the parameres are very evident, the spiculum gastrale is completely different, and in general, the structure of the spermatheca is very different. Undoubtedly, *A. tuberculata* sp. n. is more morphologically similar to *A. brunnea* JEANNEL, 1936 and its various subspecies described by SZYM CZAKOWSKI (1975), even so, there are still differences, in particular the two mid apical tubercles of the right lobe, the end of the parameres separated from the aedeagus and facing outwards, and also the spiculum gastrale of the genital segment which is divided posteriorly.

Biological data. Up to the present moment, this species seems to be common in caves and restricted to caves from one limestone lens in the Napo area. So far, it has not been collected in the epigeal environment, although the effort involved in collecting specimens in this environment is not as great as collecting them in the hypogean one. In caves it was almost always collected associated with bat guano deposits. It should be considered a troglophile.

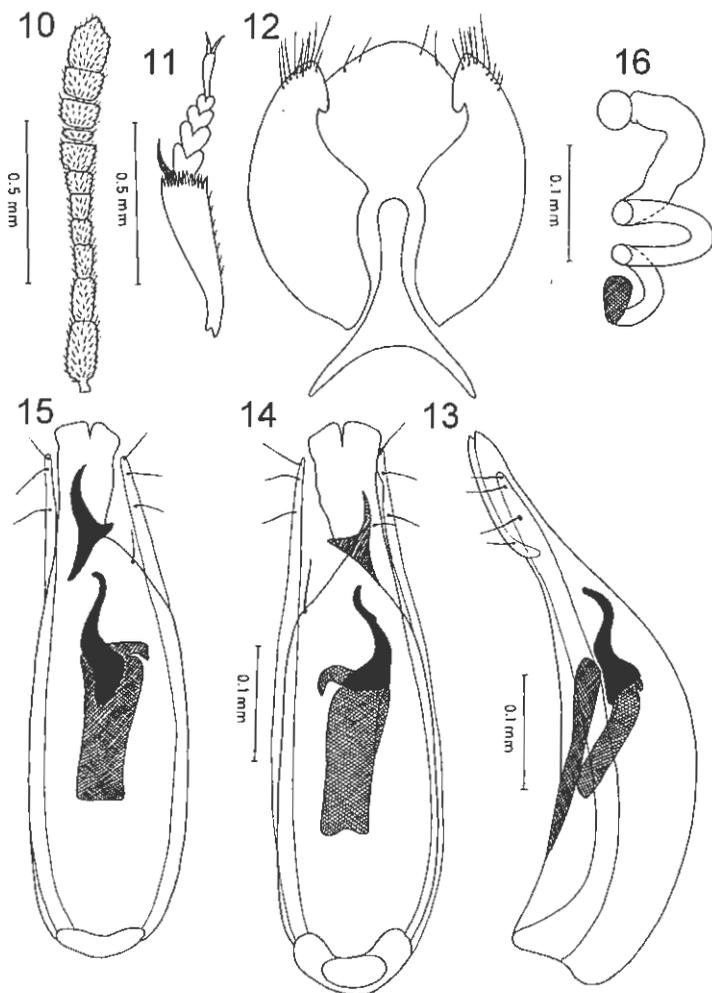
Etymology. The specific name is derived from one of the most outstanding characters of the new species, two small tubercles in the mid apical region of the right lobe of the aedeagus.

***Adelopsis onorei* sp. n.**
(Figs 10-16)

Holotype (male), description. Body length: 2.38 mm. Paratypes: 2.30-2.40 mm. Winged. General characteristics are the same as *A. tuberculata* sp. n.

Antennae short, 1.37 times as long as pronotum, slightly surpassing the posterior edge of pronotum (Fig. 10); 1st and 2nd segments bearing weak lateral keel, in dorsal-lateral view, 1st clearly longer than 2nd and almost twice as long as wide; segments 4th, 5th, 9th and 10th of equal length; 11th segment just over one and a half times the length of 10th; 8th, 9th and 10th segment transverse, 7th almost transverse and 8th just over one and a half times wider than long; using the length of the 9th segment as a basis, relative length of each segment from 1st to 11th: 2.33, 1.67, 1.33, 1.00, 1.00, 0.90, 1.07, 0.60, 1.00, 1.00, 1.67; ratios of length to width of each segment, respectively: 1.85, 2.17, 2.00, 1.50, 1.50, 1.17, 1.02, 0.58, 0.75, 0.75, 1.28.

Pronotum large, almost as wide as elytra, strongly transverse, 1.90 times as wide as long, with posterior angles protruding backwards, maximum width at posterior angles; striolae fairly strong and close together. Elytra oval-shaped,



Figs 10-16. *Adelopsis onorei* sp. n. 10, antenna; 11, protarsus and tibia; 12, genital segment; 13, 15, aedeagus, lateral, ventral and dorsal view; 16, spermatheca.

together 1.44 times as wide and 2.87 times as long as length of pronotum, weakly convex and narrowing somewhat backwards, tips weakly pointed; striolae weakly oblique, strong and close together, somewhat more marked than those of pronotum. Anterior tibiae widened in apical region; male protarsi expanded, first tarsomere narrower than maximum width of tibia (0.85); 1st and 2nd tarsomeres of equal width, 3rd slightly narrower (Fig.11). 6th ventrite similar to that of *A. tuberculata*. Genital segment slightly longer than wide, with numerous unequal setae in apical region of lateral lobes, ventral spiculum gastrale with long narrow anterior region, posterior region with long widely

open branches (Fig. 12).

Aedeagus wide from basal region to mid region, three times longer than wide, C-shaped in lateral view, basal orifice almost ventral (Fig. 13). Right lobe strongly developed, apical region in the shape of large rectangular plate, which is almost twice as long as wide, slightly sunken area in anterior mid region, small ventral seta towards lower lateral margin and a tooth in the internal basal region (Fig. 14). Apical orifice large, in dorsal view, almost triangular with a seta on the lower margin. Left lobule completely atrophied. Parameres fused to aedeagus, shorter than right lobe, bearing three setae, insertion pores of two apical seta closer and pore of interior seta clearly separated from the other two. Inner sac, with flagellum short, curved and narrow in apical region, with robust sclerotized areas at base, one of which forming a large lamina (Fig. 15).

Female. The elytral tip is somewhat round. Spermatheca with anterior region long and wide, final lobe of this region as wide as or wider than anterior region; posterior region with two turns and a sclerotized tongue-shaped structure adhered to dorsal face of copulatory sac (Fig. 16).

Type material: HOLOTYPE, ♂. Ecuador: Morona Santiago, Río y Aupi, Achiniquianas Cave, 260 m, 2° 55' 24"S - 77° 54' 21"W, 20-I-2001, QCAZ Coll., M. Vallejo leg.

PARATYPES. Ecuador: Morona Santiago, Río y Aupi, Achiniquianas Cave, 260 m, 2° 55' 24"S - 77° 54' 21"W, 20-I-2001, 1♂-2♀, FMNH Chicago Coll., 1♂-1♀, Salgado Coll., 2♀, Giachino Coll., 1♂-10♀, QCAZ Coll., M. Vallejo leg.; Napo, Archidona, Lagarto Cave, 850 m, 00° 49' 55"S - 79° 46' 79"W, 16-I-1999, 1♂-2♀, QCAZ Coll., F. Ayala leg.; Napo, Archidona, Lagarto Cave, 850 m, 00° 49' 55"S - 79° 46' 79"W, 2-XI-1998, 1♂, QCAZ Coll., M. Ávila & F. Sáenz leg.; Napo, Tena, Lagarto Cave, 850 m, 00° 49' 55"S - 77° 46' 79"W, 16-I-1999, 1♂, FMNH Chicago Coll., 1♀, Salgado Coll., 1♂, Giachino Coll., 2♂-1♀, QCAZ Coll., Olmedo leg.

Discussion. This species can be easily distinguished by the characters of the aedeagus, especially the structure of the tip of the right lobe, the shape of the spermatheca and the spiculum gastrale of the following species, which are the closest: *Adelopsis heterocera* PORTEVIN, 1907, *A. asperoides* SZYMCAKOWSKI, 1963, *A. bellatrix* SZYMCAKOWSKI, 1968, *A. piruapuera* GNASPINI, 1993 and *A. palata* GNASPINI & PECK, 2001, there are also some similarities in the spermatheca of the latter.

Adelopsis onorei sp. n. is clearly distinguished from the closest species *A. tuberculata* by various characters including: pronotum more transverse, antennal segments 1 and 2 noticeably different in length, but especially in the shape of the apical region of the right lobe, flagellum thinner and more curved, different insertion of apical setae of parameres and in the different shape of the spiculum gastrale which, similar to the previously mentioned species, is bifid, as well as a different spermatheca. All of these characters make the species unmistakable.

Biological data. As the data obtained from collection reveal, the species cohabit with *A. tuberculata* sp. n. in the Lagarto cave. So far, it has only ever been reported in caves, but it could also possibly be captured in forest litter. It

is commonly found in guano all over the cave, but scattered. It should be considered a trogliphilic species.

Etymology. The species is named for Dr. Giovanni Onore, Curator of the QCAZ-Museum, Quito (Ecuador), in recognition of his work on Ecuadorian entomology.

Adelopsis dehiscentis sp. n.
(Figs 17-25)

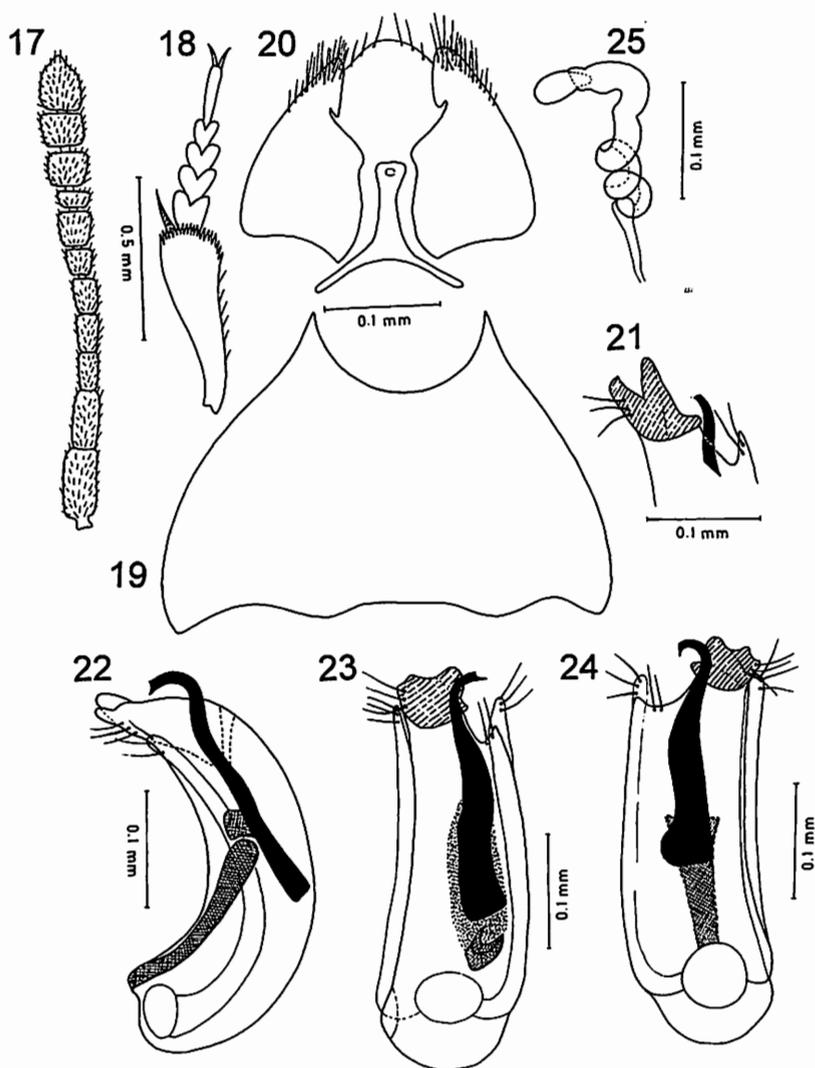
Holotype (male), description. Length: 1.92 mm. Paratypes: 1.75-1.98 mm. Winged. Uniformly oval-shaped body, back and front rounded. Color light brown; antenna color light from 9th segment onward, with last two segments pale. Pubescence golden, short, fine and laid back. Head bearing transverse, very fine striolae. Eyes well-developed.

Antennae quite long, 1.50 times as long as pronotum, surpassing pronotal base when laid back (Fig. 17); 1st segment longer than 2nd and 11th, which are of equal length; 3rd, 4th, 5th, 7th and 9th equal in length, 10th slightly shorter; 8th segment clearly transverse, 9th and 10th slightly transverse; using length of the 9th segment as a basis, relative length of each segment from 1st to 11th: 2.00, 1.74, 1.00, 1.00, 1.00, 0.77, 1.00, 0.54, 1.00, 0.98, 1.74; ratios of length to width of each segment, respectively: 2.60, 2.74, 1.50, 1.50, 1.50, 1.10, 1.25, 0.64, 0.93, 0.85, 1.38.

Pronotum 1.79 times as wide as long, slightly narrower than elytra, widening towards the base, which is widest; sides anteriorly rounded, almost rectilinear in posterior half; striolae transverse and easily visible, quite fine and clearly separated from each other. Elytra not pointed at tip, together 1.40 times as long as wide and 2.62 times as long as length of pronotum; striolae transverse and slightly oblique, stronger and further apart than those on pronotum. Anterior tibiae 6 times longer than wide; protarsi weakly dilated, with first tarsomere 0.62 times as wide as the maximum width of tibia (Fig. 18). 6th ventrite bearing two small lobes in the region anterior margin, lateral tips strongly pointed (Fig. 19). Genital segment some wider than long, ventral spiculum gastrale with three fairly long narrow branches, posterior ones widely open (Fig. 20).

Aedeagus three times longer than wide, with very complex apical region (Fig. 21); right lobe with anterior region strongly sclerotized and apically bifid, three setae inserted near external margin (Fig. 22); left lobe visible, very weakly developed, lacking setae. Apical orifice reduced and narrow, with 2-3 setae on lower margin. Parameres shorter than right lobe and fused to the aedeagus, but fairly stout and visible, with three fairly long apical setae and insertion pores close together. Flagellum of internal sac long and robust, with thick basal region and curved apical region surpassing dorsal orifice, flagellum resting on long sclerotized piece (Figs. 23-24).

Female. Anterior region of spermatheca similar in length and width, bearing elongate apical bulb; posterior region coiled with 3-turns (Fig. 25).



Figs 17-25. *Adelopsis dehiscentis* sp. n. 17, antenna; 18, protarsus and tibia; 19, 6th ventrite; 20, genital segment; 21-24, aedeagus, tip, lateral, ventral and dorsal view; 25, spermatheca.

Type material: HOLOTYPE, ♂. Ecuador: Los Ríos, Centro Científico Río Palenque, 4-I-1981, QCAZ Coll., S. Sandoval leg.

PARATYPES. Ecuador: Los Ríos, Centro Científico Río Palenque, 4-I-1981, 1♂-1♀, FMNH Chicago Coll., 1♂, Salgado Coll., 1♂, Giachino Coll., 1♀, QCAZ Coll., S. Sandoval leg.; 4-I-1980, 1♂, QCAZ Coll., S. Sandoval leg.; 10-I-1981, 1♂-2♀, QCAZ Coll., S. Sandoval leg.; 20-21-XII-1980, 1♀, Salgado Coll., 1♀, Giachino Coll., 1♀ QCAZ Coll., S. Sandoval leg.; 8-I-1981, 1♀, QCAZ Coll., S. Sandoval leg.; 11-I-1981, 1♀, QCAZ Coll., S. Sandoval

leg. Pichincha, Centro Científico Río Palenque, 29-XII-1980, 1♀; 23-XII-1981, 1♀, QCAZ Coll., S. Sandoval leg.

Discussion. The complex structure of the apical region of the aedeagus, the spiculum gastrale of the genital segment and shape of the spermatheca have characters that clearly differentiate *A. dehiscens* sp. n. from any other species of *Adelopsis*.

However, the body shape and structure of the antennal segments in *Adelopsis dehiscens* are very similar to those of *A. bellatrix* SZYMCAKOWSKI, 1968, although the last two antennal segments in *A. dehiscens* are pale; the final region of the aedeagus also shows some similarities, even so, the differences are still very noticeable, particularly in the shape of the apical region of the right lobe and in the distribution and number of setae. In relation to *A. bifida* GNASPINI & PECK, 2001, which belongs to the group *capitanea*, the similarities in some structures are obvious, though clear differences do exist, as *A. dehiscens*, besides being smaller, exhibits narrower male protarsi, vertices of the 6th ventrite more pointed, narrower spiculum gastrale with longer lateral prolongations, and finally, aedeagus wider in apical region, parameres stouter and different chaetotaxy.

Biological data. Few data are available on this species, though it does appear to inhabit forest litter.

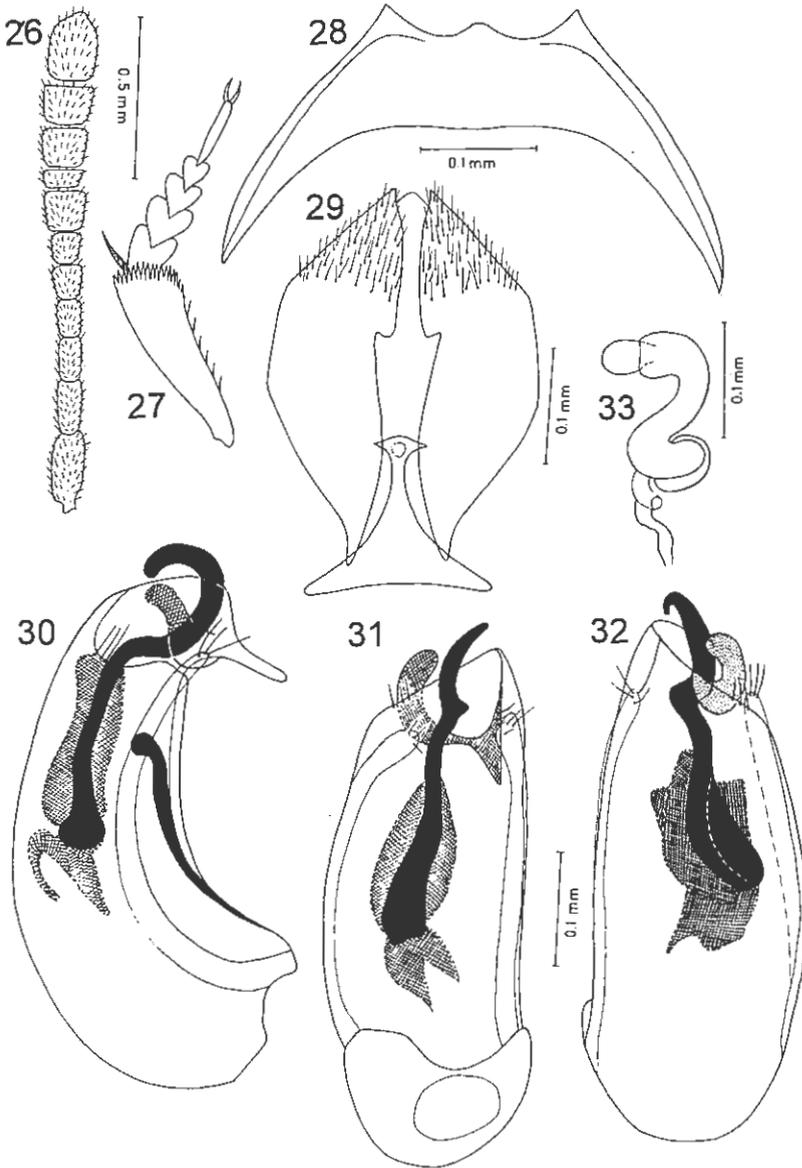
Etymology. The name is derived from the Latin for "dehiscens" (=opened or divided), referring to the tip of the right lobe of the aedeagus, which is widely opened.

Adelopsis ecuatoriana sp. n.
(Figs 26-33)

Holotype (male), description. Body length: 2.17 mm. Paratype (female): 2.05 mm. Winged. Uniformly oval-shaped. Color light reddish, apical region of the elytra lighter, last three antennal segments pale. Pubescence golden, short, fine and laid back. Head bearing very weakly discernible transverse striolae. Eyes well developed.

Antennae very short, 1.16 times as long as pronotum, not reaching base of elytra when laid back (Fig. 26); 1st to 5th and 11th segments longer than wide; 1st longer than 2nd and slightly longer than 11th; 3rd, 7th, 9th and 10th segments of equal length; 7th to 10th segments transverse; 11th segment just over one and a half times the length of 10th, and just wider; using the length of the 9th segment as a basis, relative length of each segment from 1st to 11th: 1.83, 1.34, 1.00, 0.90, 0.84, 0.70, 1.00, 0.53, 1.00, 1.00, 1.74; ratio of length to width of each segment, respectively: 1.83, 1.60, 1.50, 1.35, 1.25, 1.05, 1.00, 0.53, 0.86, 0.82, 1.34.

Pronotum slightly convex, 1.64 times as wide as long, slightly more narrow than elytra; maximum width close to posterior angles; sides weakly rounded in anterior half, almost parallel in basal half; basal edge rectilinear, lacking notches; posterior angles acute but weakly defined; striolae transverse, fairly



Figs 26-33. *Adelopsis ecuatoriana* sp. n. 26, antenna; 27, protarsus and tibia; 28, 6th ventrite; 29, genital segment; 30-32, aedeagus, lateral, ventral and dorsal view; 33, spermatheca.

fine and close together, slightly undulate. Elytra elongate, weakly convex, maximum width near base, not apically pointed, together 1.37 times as long as wide and 2.30 times as long as length of pronotum; sutural striae complete and

deep; transverse striolae stronger with greater distance between them than those on pronotum. Mesosternal carina raised, not angulose, profile uniformly rounded. Legs with apical shield characteristic of Ptomaphagini; anterior tibiae short and widened at tip; protarsi expanded, with first tarsomere 0.82 times as wide as the maximum width of tibia; 1st and 2nd tarsomeres of equal width, 3rd slightly narrower (Fig. 27). 6th ventrite bearing small lobe in mid region of posterior margin and lateral regions pointed (Fig. 28). Genital segment longer than wide, ventral spiculum gastrale with short narrow anterior region and posterior region widened but not divided (Fig. 29).

Aedeagus almost three times longer than wide, with apical orifice reduced and basal orifice almost ventral; in lateral view, apical region of right lobe has very unusual shape, as it projects in the form of a lobe and beak, in which 3 setae are inserted in the external basal region (Figs 30-31). Left lobe strongly reduced, lacking setae. Flagellum very long, ending with a one-turn coil, outside the aedeagus in rest position. Parameres slightly dilated at tip, with 3 setae. In dorsal view, 3 setae in lower margin of apical orifice (Fig. 32).

Female. Spermatheca with anterior region widened and slightly sinuous, lobe narrower than apical anterior region; posterior region sinuous, strongly narrow, with one differentiated turn (Fig. 33).

Type material: HOLOTYPE, ♂. Ecuador: Cotopaxi, San Francisco de las Pampas, Otonga, 2000 m, 00° 25'S - 79° 00'W, 22-VII-1999, QCAZ Coll., I. Tapia & P. Ponce leg.

PARATYPE, 1♀. Ecuador: Cotopaxi, San Francisco de las Pampas, Otonga, 2000 m, 00° 25'S - 79° 00'W, 22-VII-1999, QCAZ Coll., I. Tapia & P. Ponce leg.

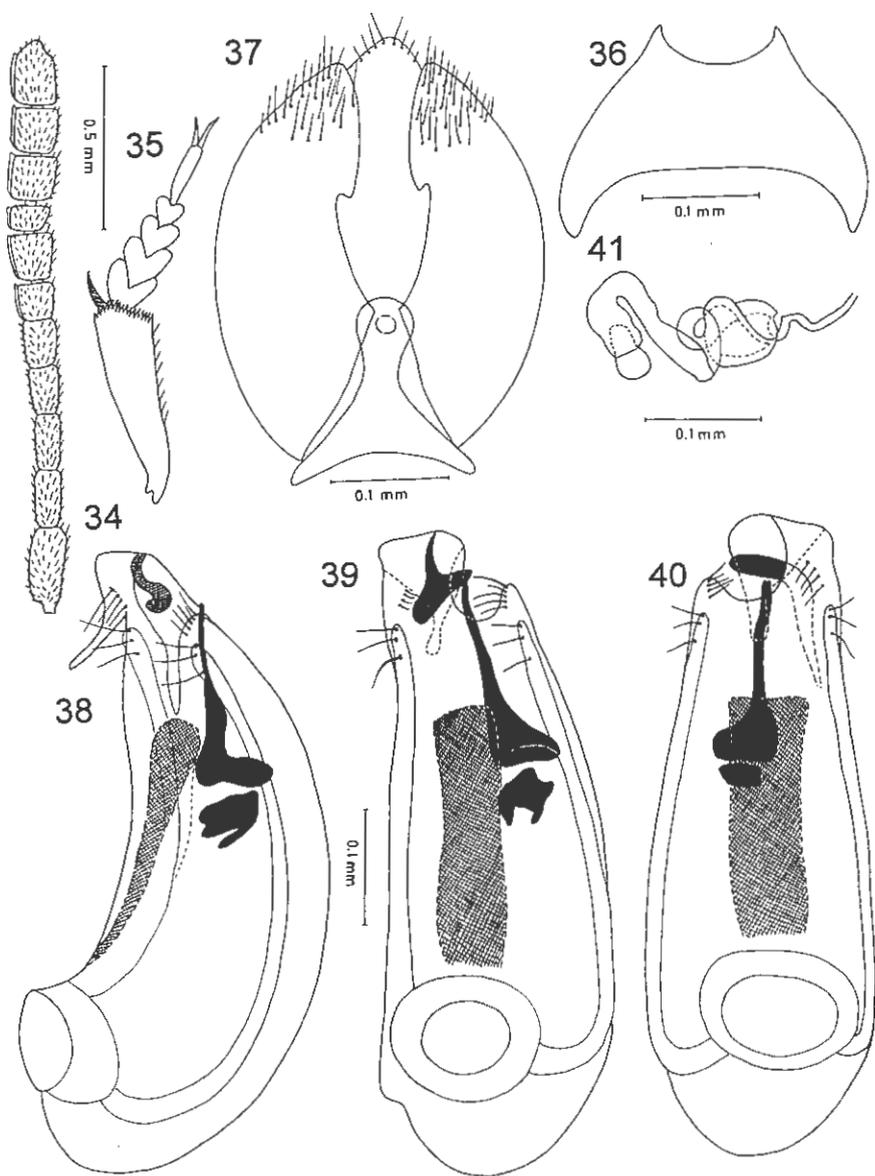
Discussion. The characters in the genital segment, aedeagus and spermatheca make this species unmistakable. Nevertheless, *Adelopsis ecuatoriana* sp. n. resembles some of the species described by GNASPINI & PECK (1996) from Costa Rica and Panama and GNASPINI & PECK, 2001 from Colombia, in relation to certain similarities in the previously-mentioned structures; for example there is a certain similarity with *Adelopsis stella* GNASPINI & PECK, 1996, *A. dybasi* GNASPINI & PECK, 1996, *A. elephas* GNASPINI & PECK, 1996, *A. albinna* GNASPINI & PECK, 1996 and *A. calarcensis* GNASPINI & PECK, 2001. However, the differences are very manifest, especially some of the structures of the aedeagus, mainly in the shape of the apical region and the chaetotaxy, and also in some cases, the shape of the spermatheca and in others, the genital shield.

Biological data. The specimens were captured in the forest litter at an altitude of 2000 m.

Etymology. The name is derived from the gentilic "ecuatoriano/a", which means belonging to Ecuador.

***Adelopsis bioforestae* sp. n.**
(Figs 1, 34-41)

Holotype (male), description. Body length: 3.05 mm. Paratypes: 2.97-3.15 mm. Winged. Elongate oval-shaped body, weakly convex (Fig. 1). Color dark



Figs 34-41. *Adelopsis bioforestae* sp. n. 34, antenna; 35, protarsus and tibia; 36, 6th ventrite; 37, genital segment; 38-40, aedeagus, lateral, dorsal and ventral view; 41, spermatheca.

brown. Antennae color lightening from 8th segment onward, with last three segments pale. Pubescence golden, fine and laid back. Head covered in fine points lined up, forming very fine transverse striolae close together. Eyes well developed.

Antennae quite slender, 1.39 times as long as pronotum (Fig. 34); bearing external keel from 6th to 11th segments, 1st segment cylindrical, longer and slightly thicker than 2nd; 8th to 10th segments clearly transverse, 6th and 7th almost transverse; using length of 9th segment as a basis, relative length of each segment from 1st to 11th: 1.77, 1.33, 1.33, 1.06, 1.06, 0.95, 1.21, 0.47, 1.00, 1.00, 1.65; ratios of length to width of each segment, respectively: 2.15, 1.88, 2.09, 1.64, 1.64, 1.04, 1.02, 0.42, 0.85, 0.85, 1.37.

Pronotum quite long, weakly convex and weakly narrow towards front, 1.60 times as wide as long, just narrower than elytra, maximum width at base; sides very weakly arcuate, profile slightly sinuate in posterior region; posterior angles protruding backwards, basal edge slightly sinuate; transverse striolae fine and close together. Elytra together 1.46 times as long as wide and 2.56 times as long as pronotum; very weakly convex; apical edge weakly truncate; striolae clearly defined and set apart. Sutural striae entire and clearly defined in whole length. Anterior tarsi strongly dilated, almost as wide as maximum width of tibiae (0.92); first three tarsomeres almost equal in width (Fig. 35). 6th ventrite emarginate posteriorly, lateral areas strongly pointed and tips facing inwards (Fig. 36). Genital segment longer than wide, spiculum gastrale of branches very short, anterior one slightly widened and weakly discernible split between the two posterior ones (Fig. 37).

Aedeagus thick, just over two and a half times longer than wide, basal orifice almost ventral; right lobe developed, in lateral view, with pointed protuberance, and 4-5 marginal setae (Fig. 38); in dorsal view, right lobe forming a plate-like structure outlining the apical orifice which is elongate and oval-shaped (Fig. 39). Left lobe weakly prominent, blunt and bearing 5 fairly long setae. Parameres laterally joined aedeagus, shorter than lobes and bearing 3 fairly long apical setae. Inner sac, with flagellum short and strong, resting basally on weakly defined sclerotized pieces and one long ventral piece (Fig. 40).

Female. Spermatheca with two turns in posterior region (basal), and a tongue-like structure resting on the dorsal face of the copulatory sac; anterior region (distal) elongate, almost the same width, with well-developed lobe, as wide as apical section of anterior region (Fig. 41).

Type material: HOLOTYPE, ♂. Ecuador: Cotopaxi, San Francisco de las Pampas, Otonga, 2000 m, 00° 25'S - 79° 00'W, 22-VII-1999, QCAZ Coll., I. Tapia & P. Ponce leg.

PARATYPES. Ecuador: Cotopaxi, San Francisco de las Pampas, Otonga, 2000 m, 00° 25'S - 79° 00'W, 2-VIII-1997, 1♀, QCAZ Coll.; 24-VII-1997, 1♂-1♀, FMNH Chicago Coll., I. Tapia & P. Ponce leg.; Cotopaxi, San Francisco de las Pampas, Otonga, 2200 m, 00° 19' 11"S - 78° 57' 00"W, 17-III-1997, 1♀, QCAZ Coll.; 4-IV-1997, 1♂, Salgado Coll.; 30-VI-1997, 1♀; QCAZ Coll., I. Tapia & P. Ponce leg.

Discussion. *A. bioforestae* sp. n. generally exceeds 3 mm in size and is the largest of the described *Adelopsis* from Ecuador. Morphologically it is very similar to *A. luculentus* SZYM CZAKOWSKI, 1963, although there are some

differences in the male protarsi and antennae, however the difference between these two species is very clear after examining the genital segment, aedeagus and spermatheca.

The shape of the apical region of the aedeagus in *A. bioforestae* is reminiscent of many species belonging to the group **elephas** GNASPINI & PECK, 1996, as in lateral view a pointed protuberance forming the right lobe can be seen. Undoubtedly, the most proximate species in this group to *A. bioforestae* is *A. jarmilae* GNASPINI & PECK, 2001. It is easily differentiated by its larger size, final antennal segments bearing external keel, wider apical region and different shape of aedeagus, and more numerous setae with different insertion.

Biological data. All the examined specimens were captured in forest litter.

Etymology. The name is derived from "bioforest", as this new species is named after the "Bioforest Association", to which the naturalists who promoted the establishment of the Otonga Reserve belong.

Taxonomic position

During this study, several characters were very important for the characterisation of the 5 new species described. Based on the examination of various papers by GNASPINI (1993, 1996), GNASPINI & PECK (1996, 2001) and PECK *et al.*, (1998), it can be stated that *Adelopsis tuberculata* sp. n. and *A. onorei* sp. n. belong to the group **ascutellaris** Gnaspini & Peck, 2001, as they have the following characters in common: the tip of the aedeagus flattened, generally rectangular when seen frontally; a short flagellum of aedeagus and a 2-turns spermatheca. A very significant difference is observed in the spiculum gastrale of genital segment what is divided in posterior region.

A. dehiscentis sp. n. should be related to with species belonging to the group **capitanea** Gnaspini & Peck, 2001 by their very globose aedeagus, with a bifid tip; generally long and strong flagellum of the aedeagus; spiculum gastrale straight and bifid tip; similar 6th ventrite and spermatheca. There are, however, certain differences such as smaller body size, the shape of the protarsomeres and the lack of the keels in antennae; all of these characters of a less significance phylogenetic.

Finally, *Adelopsis ecuatoriana* sp. n. and *A. bioforestae* sp. n., should be assigned to the group **elephas** Gnaspini & Peck, 1996, which is characterised by the pointed tip of the aedeagus bent ventrally, giving a beaked impression, in lateral view; several setae at the right side of the tip, and several setae at the left side, facing posteriorly; the flagellum of the aedeagus generally long and strong, with a widened basal region; the spiculum gastrale divided at the tip. Some differences can be observed, especially the keels in the final antennal segments of *A. bioforestae*.

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