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Two new species of *Amazonopora* Pace 1996 (Coleoptera Staphylinidae Aleocharinae) from Peru and French Guiana with a discussion of its phylogenetic relationships *

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A systematic review of the aleocharine genus *Amazonopora* Pace 1996 is presented. *Amazonopora* is redescribed, and three species are recognized, two of which are described as new (*A. lescheni* n. sp., type locality: Peru, Campamento San Jacinto, 2°18.75'S, 75°51.77'W; and *A. brooksi* n. sp., type locality: French Guiana, Roura, 39.4 km SSE, 270 m 4°32'43"N, 52°8'26"W). Types and paratypes of the two new species are designated. A key is provided for separation of known species of *Amazonopora* and illustrations of diagnostic features are provided. *Amazonopora* is hypothesized to be a member of the tribe Myllaenini based on the very small gland opening on the anterior margin of tergite VII; antero-lateral angles of mentum prolonged into spinose processes; lacinia of maxilla elongate, slender, with distinctive distribution of spines interdigitating with spinose scales; galea shorter and much more slender than lacinia, with distinctive small patch of setae on apex, and without setae on mesal edge; cardo of maxilla very elongate; medial pseudopore field narrow, without pseudopores; lateral pseudopore fields of prementum without pseudopores; and, labial palpi elongate and stylate.

KEY WORDS: *Amazonopora*, new species, Aleocharinae, Staphylinidae, Coleoptera, phylogenetic relationships, Peru, French Guiana.

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INTRODUCTION

Amazonopora was first described and characterized by PACE (1996) based on the new species *A. manausensis* from Manaus, Brazil. He placed *Amazonopora* in the tribe Diglottini (sensu PACE 1986) within which he included intertidal species such as *Diglotta* Champion 1887, and *Bryothinusa* Casey 1904, even though he noted that *Amazonopora* shared many mouthpart features with members of *Myllaena* Erichson 1837 (tribe Myllaenini). However, he did not provide sufficient characters by which the Diglottini could be differentiated from the Myllaenini. Our study of *Amazonopora* prompted us to reexamine the tribal placement of this species, and the status of the Diglottini, Myllaenini and related taxa in more detail, and to initiate a phylogenetic analysis of the myllaenine genera and related (K.-J. AHN & J.S. ASHE in preparation) which will comprise problematic genera in the Diglottini, Myllaenini, Promaenini and Dimonomini.

In this paper we redescribe *Amazonopora*, describe two new species (*A. leschenni* and *A. brooksi*) and discuss phylogenetic relationships of *Amazonopora*.

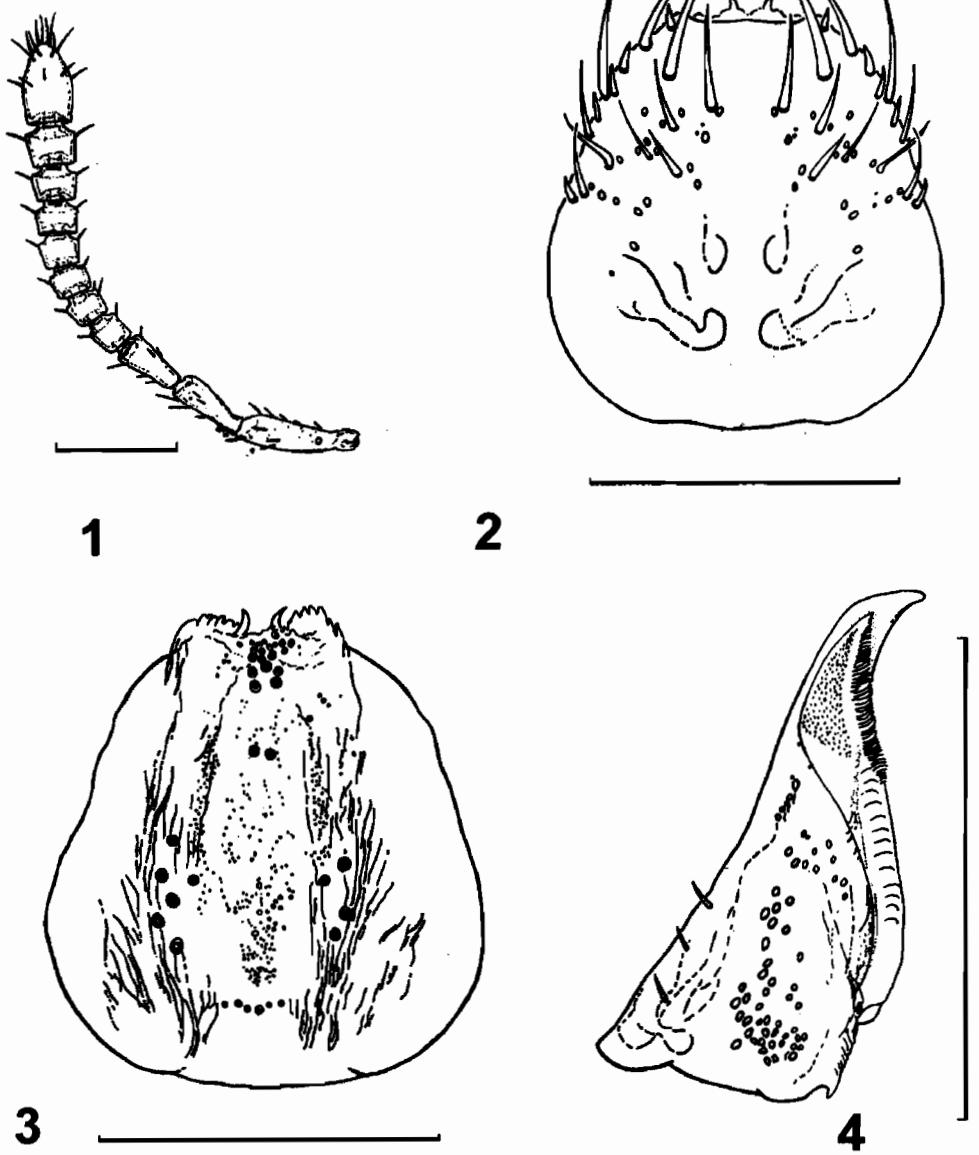
Genus *Amazonopora* Pace 1996

Amazonopora PACE 1996: 38.

Diagnostic combination. Among aleocharine genera, members of *Amazonopora* are recognized by the combination of: more or less circular labrum (Fig. 2); elongate mandible (Fig. 4); distinctive structure and distribution of lacinial and galeal spines and setae (Fig. 5); two minute setae present on triangular ligula (Fig. 6); stylate labial palpi (Fig. 6) antero-lateral angles of mentum prolonged into spinose processes (Fig. 7); transverse pronotum; umbilicus present on pronotum; hypomera visible in lateral aspect; contiguous mesocoxal cavities, not margined posteriorly; more or less pointed mesosternal process; anterior margin of sternite IV with numerous pores; small gland opening on tergite VII; and body not fusiform.

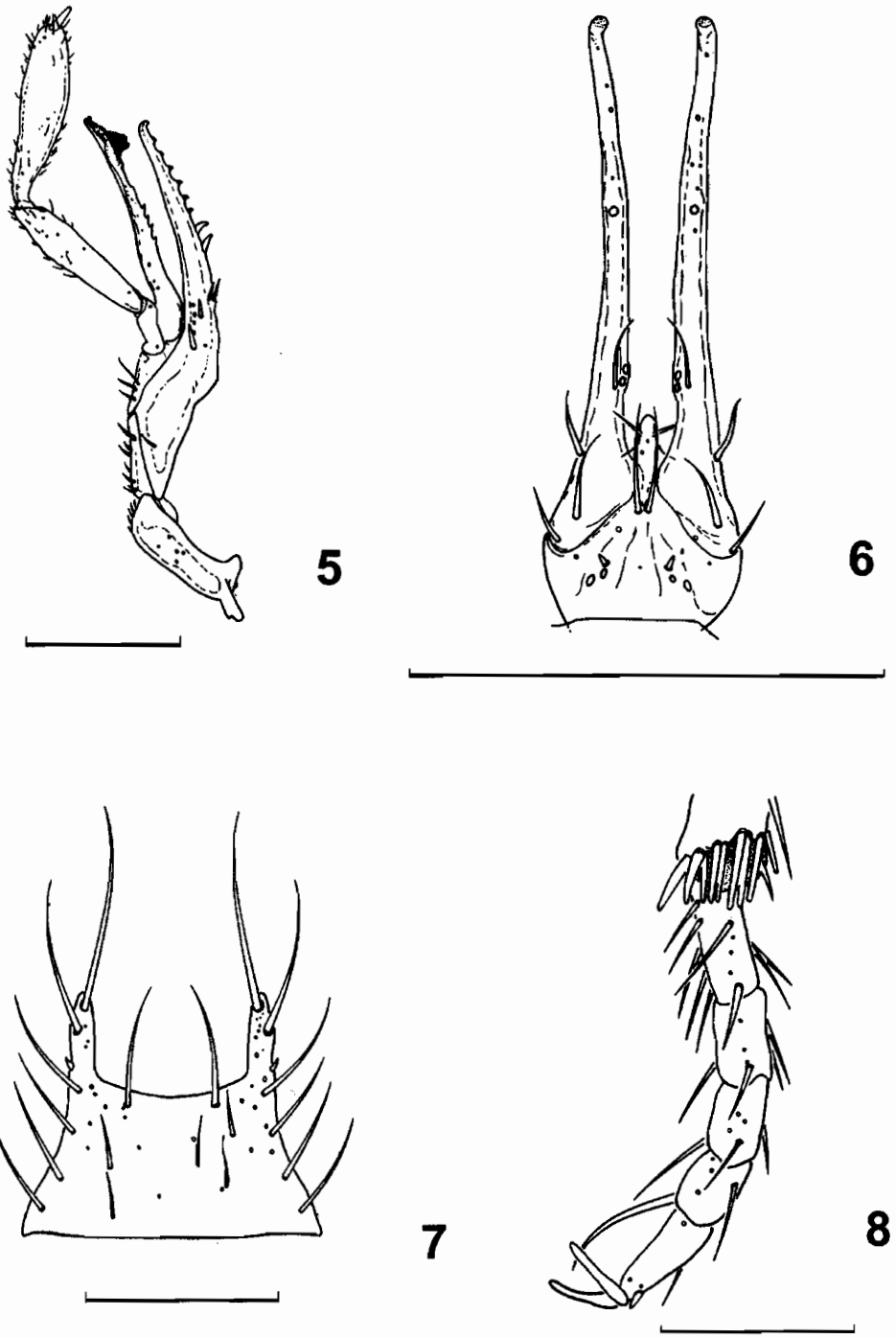
Description. Small, body length 2.0-2.1 mm. Body shape more or less parallel-sided. Body color brown or dark brown. *Head*: slightly deflexed, almost as long as wide. Eyes about 0.5 times length of tempora. Tempora long. Neck absent. Infraorbital carina complete or incomplete. Microsetae more or less uniformly distributed. Antenna (Figs 1 and 13) with 11 antennomeres; antennomeres 2-4 each shorter than preceding, 4 quadrate or transverse, 5-10 transverse. *Mouthparts*: labrum (Fig. 2) about as long as wide, broadly and evenly rounded in apical outline, 10 + 10 major setae distinct, lateral setae short, a-sensilla large; epipharynx as in Fig. 3. Mandibles (Fig. 4) elongate, median tooth absent from both mandibles, at best faintly present on right; prostheca developed, membranous with fibrils; many sensory pores scattered. Maxilla (Fig. 5) with galea and lacinia elongate, galea narrow-

er and shorter than lacinia; galea corneous, apical 1/10 pubescent with distinctive patch of filiform setae, absent on mesal surface; lacinia with distinctive distribution of spines interdigitating with spinose scales, a pair of hook-like setae present near base of lacinia; maxillary palpus with 4 articles, elongate, article 3 ovoid, article 4 longer than half of maximum width of 3; cardo very elongate. Labial palpi (Fig. 6) with 2 articles, extremely elongate, most setae distributed basally; twin pores, median pore, and distal pore present; two minute setae present on triangular ligula;



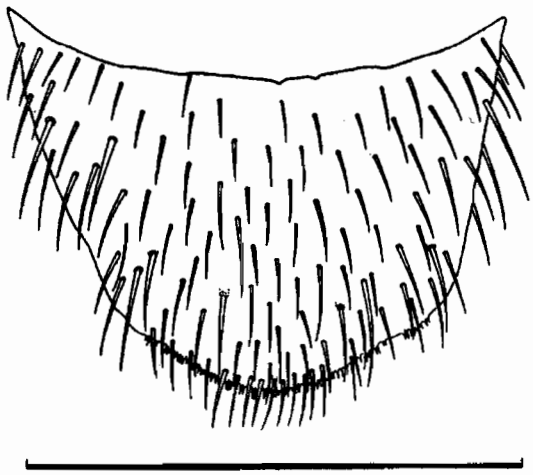
Figs 1-4. — *Amazonopora lescheni*. Fig. 1, antenna, lateral aspect; Fig. 2, labrum, dorsal aspect; Fig. 3, epipharynx, ventral aspect; Fig. 4, mandible, ventral aspect. Scales 0.1 mm.

prementum with two medial setae present side by side, real pores and setal pores present, basal pores indistinct, median pseudopores absent in very narrow median area, pseudopores absent in lateral areas; a pair of comb-like hypoglossae present adorally. Mentum (Fig. 7) with antero-lateral angles prolonged into spinose process-



Figs 5-8. — *Amazonopora lescheni*. Fig. 5, maxilla, dorsal aspect; Fig. 6, labium, dorsal aspect; Fig. 7, mentum, dorsal aspect; Fig. 8, hind tarsus, lateral aspect. Scales 0.1 mm.

es, anterior margin truncate between the lateral processes, two long medial setae present. *Thorax*: pronotum transverse, 1.4 times as wide as long, narrowest at base



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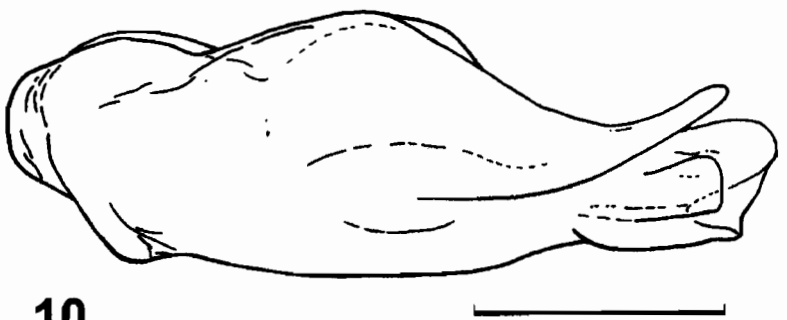

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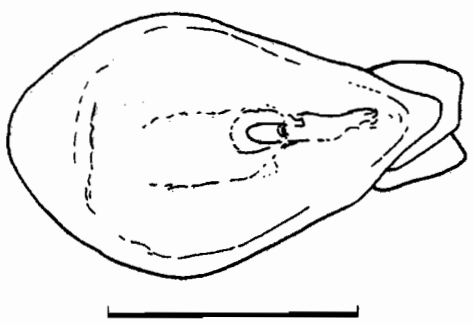

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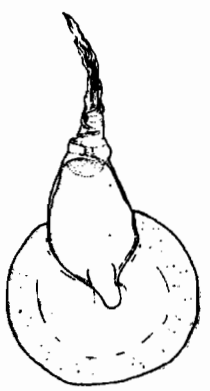

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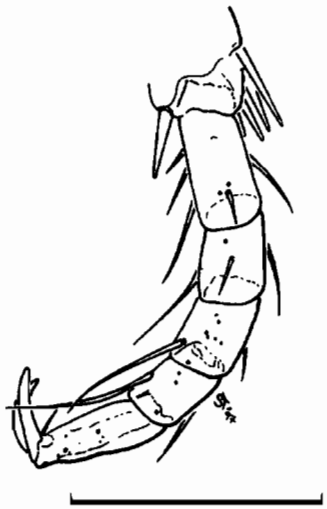
Figs 9-12. — *Amazonopora lescheni*. Fig. 9, sternite VIII, dorsal aspect; Fig. 10, median lobe, lateral aspect; Fig. 11, median lobe, dorsal aspect; Fig. 12, spermatheca, lateral aspect. Scales 0.1 mm.

13



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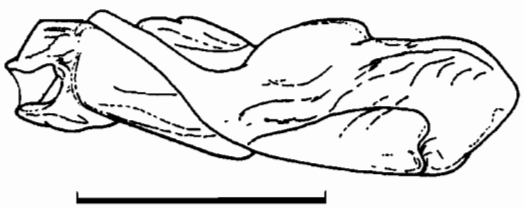

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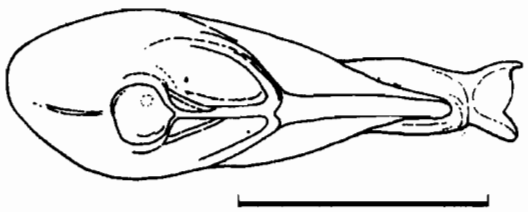

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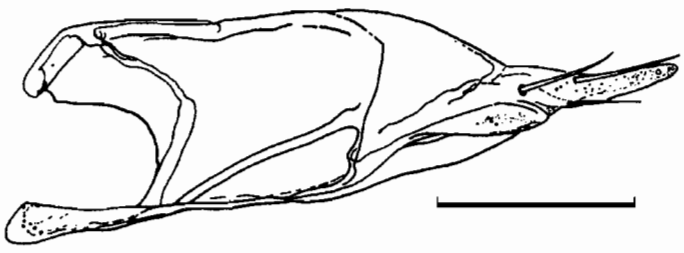

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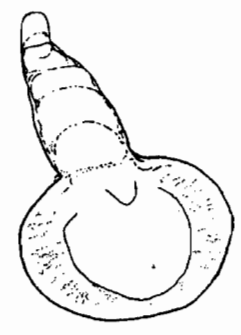

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Figs 13-18. — *Amazonopora brooksi*. Fig. 13, antenna, lateral aspect; Fig. 14, hind tarsus, lateral aspect; Fig. 15, median lobe, lateral aspect; Fig. 16, median lobe, dorsal aspect; Fig. 17, paramere, lateral aspect; Fig. 18, spermatheca, lateral aspect. Scales 0.1 mm.

and widest near apical third, basal margin almost straight, apical margin very slightly prolonged anteriorly; umbilicus present; macrosetae present on lateral margin; microsetae uniformly distributed; pubescence at narrow midline directed anteriorly in anterior half to third and posteriorly in posterior half to 2/3, and others directed laterally. Hypomera entirely visible in lateral aspect. Mesocoxal cavities contiguous, not margined posteriorly; mesosternal process more or less pointed, reaching half length of mesocoxal cavities. Metasternal episternum with carina. *Legs*: tarsal formula 4-4-5; basal tarsomere of hind leg about as long as 2 or slightly longer than 2; one empodial seta present, not spatulate (Figs 8 and 14). *Elytra*: 0.8 times as long as pronotum; microsetae numerous, directed posteriorly, uniformly distributed; macrosetae present on lateral margins; postero-lateral margin not sinuate, almost straight; distinctive sculpture present. Hind wings present. *Abdomen*: general shape broad at base, sides uniformly converging to rounded apex; macrosetae numerous. Tergites III-VI impressed at base. Sternites not constricted at base. Anterior margin of sternite IV with numerous pores. Tergite VII with small gland opening. *Secondary sexual characteristics*: posterior margin of female sternite VIII (Fig. 9) with several microsetae and numerous spinules. Male unmodified. *Aedeagus*: median lobe (Figs 10-11, 15-16). Parameres (Fig. 17) with narrow condylite and paramerite; apical lobe with one short seta apically, two long setae medially and one long seta basally. Spermatheca as in Figs 12 and 18.

Type species. *Amazonopora manausensis* Pace 1996.

Distribution. Brazil, French Guiana, and Peru.

Key to species of *Amazonopora* Pace 1996

1	Body dull; antennomere 4 quadrate (Fig. 1); median lobe as in Figs 10-11; spermatheca as in Fig. 12 ..... *A. lescheni* n. sp.	
—	Body shiny; antennomere 4 transverse (Fig. 13); median lobe and spermatheca different	2
2	Median lobe as in Figs 15-16; spermatheca as in Fig. 18 ..... *A. brooksi* n. sp.	
—	Spermatheca as in fig. 5 (PACE 1996) ..... *A. manausensis* Pace 1996	

Amazonopora lescheni n. sp.

Description. Body dull, length 2.0 mm. Body color brown or dark brown. *Head*: almost as long as wide, antennomere 4 subquadrate, 5-10 transverse. Infraorbital carina incomplete. *Legs*: basal tarsomere of hind leg slightly (1.1 times) longer than 2. *Abdomen*: male tergite VIII not sinuate; male sternite VIII not prolonged. *Aedeagus*: median lobe (Figs 10-11). *Spermatheca*: as in Fig. 12.

Type series. Holotype, male, labelled as follows: 'Peru: Dept. Loreto Campamento San Jacinto, 2°18.75'S, 75°51.77'W, 2 July 1993, 175-215 m, Richard Leschen #3, *ex* flood debris Qd. 16; Holotype, *Amazonopora lescheni* Ashe and Ahn, Desig. J.S. Ashe and K.-J. Ahn, 1998.' deposited in the Museo de Historia Natural, Universidad Nacional Mayor San Marcos (MHN),

Table 1.

Similarities and differences between members of *Amazonopora* Pace and members of other myllaenine genera.

	Amazonopora	*Bryothinusa*	*Myllaena*	*Pseudomniophila*	*Rothium*
Body form	not fusiform	not fusiform	fusiform	fusiform	not fusiform
Labrum shape	more or less circular	more or less circular	more or less circular	more or less circular	more or less circular/transverse
Mandible shape	elongate	elongate	elongate	elongate	elongate
Distribution of lacinial setae	interdigitating with spinose scales	interdigitating with spinose scales	interdigitating with spinose scales	interdigitating with spinose scales	interdigitating with spinose scales
Galea shape	narrower and shorter than lacinia	narrower and shorter than lacinia	narrower and shorter than lacinia	narrower and shorter than lacinia	narrower and shorter than lacinia
Maxillary palp 3 shape	ovoid	ovoid	ovoid	dilated	ovoid
Maxillary palp 4	not shorter than half of maximum width of 3	shorter than half of maximum width of 3	shorter than half of maximum width of 3	not shorter than half of maximum width of 3	shorter than half of maximum width of 3
Cardo shape	very elongate	very elongate	very elongate	very elongate	very elongate
Labial palpi shape	very elongate	elongate	very elongate	very elongate	elongate
Ligula shape	triangular	simple, parallel-sided	simple, parallel-sided	simple, parallel-sided	simple, round
Ligula with	two setae	two setae	two setae	absent	two setae/absent
Distribution of setae on labial palpi	basally distributed	basally distributed	basally distributed	basally distributed	basally distributed
Median pseudopores	absent	absent	absent	absent	absent
Lateral pseudopores	absent	absent	absent	absent	absent

(continued)

Table 1 *(continued)*

	Amazonopora	*Bryothinusa*	*Myllaena*	*Pseudomniophila*	*Rothium*
Antero-lateral angles of mentum	prolonged into spinose processes	prolonged into spinose processes	prolonged into spinose processes	prolonged into broad lobes	prolonged into spinose processes
Two long medial setae on mentum	present	present	present	present	present
Pronotum shape	transverse	subquadrate	very transverse	very transverse	very transverse/transverse
Hypomera in lateral view	visible	visible	not visible	not visible	visible
Postero-lateral margins of elytra	not sinuate	not sinuate	sinuate	strongly sinuate	not sinuate
Mesocoxal cavities	contiguous	contiguous	contiguous	separated	separated
Posterior margin of mesocoxal cavities	not margined	not margined	margined	margined	margined
Apex of mesosternal process	more or less pointed	sharply pointed	sharply pointed	emarginate with spinose lateral margin	broadly rounded
Tarsal formula	4-4-5	4-4-5	4-4-5	4-5-5	4-4-5/4-5-5
Empodial setae	not spatulate	spatulate	spatulate	not spatulate	spatulate
Gland opening on tergite VII	small	small	small	medium	small
Tergite X	not bifid	not bifid	bifid	bifid	not bifid
Apical lobe of paramere	elongate	elongate	elongate	elongate	elongate/not elongate
Scale-shaped body sculptures	absent	absent	indistinctly present	distinctly present	absent

Lima, Peru. Paratypes, 3; 'Peru: Dept. Loreto Teniente Lopez, 2°35.66'S, 76°06.92'W, 24 July 1993, 210-240 m, Richard Leschen, #193, *ex* flight intercept trap' [KSEM, 1], 'Peru: Dept. Loreto 1.5 km N. Teniente Lopez, 2°35.66'S, 76°06.92'W, 24 July 1993, 210-240 m, Richard Leschen #189, *ex* flight intercept trap' [MHN, 1; KSEM, (on slide)].

Distribution. Peru.

Amazonopora brooksi n. sp.

Description. Body shiny, length 2.0 mm. Body color dark brown. *Head*: almost as long as wide, antennomere 4-10 transverse. Infraorbital carina complete. *Legs*: basal tarsomere of hind leg as long as 2. *Abdomen*: male tergite VIII sinuate; male sternite VIII prolonged. *Aedeagus*: median lobe (Figs 15-16). Parameres (Fig. 17). *Spermatheca*: as in Fig. 18.

Type series. Holotype, labelled as follows: 'French Guiana: Roura, 39.4 km SSE, 270 m 4°32'43"N, 52°8'26"W, 29 May-10 Jun 1997, J. Ashe, R. Brooks, FG1AB97 *ex*: flight intercept trap; Holotype, *Amazonopora brooksi* Ashe and Ahn, Desig. J.S. Ashe and K.-J. Ahn, 1998.' deposited in the Snow Entomological Museum, University of Kansas (KSEM), Lawrence. Paratypes, 45; same data as type (KSEM, 17); Roura, 18.4 km SSE, 240 m 4°36'38"N, 52°13'25"W, 29 May-10 Jun 1997 (KSEM, 12); 'French Guiana: Cayenne, 33.5 km S and 8.4 km NW of Hwy N 2 on Hwy D5, 30 m 4°48'18"N 52°28'41"W, 29 May-9 Jun 1997, J.S. Ashe, R. Brooks, FG1AB97, 171 *ex*: flight intercept trap (KSEM, 11); Peru: Dept. Loreto, Campamento San Jacinto 2°18'75"S, 75°51'77"W, 3 July 1993, 175-215 m, Richard Leschen, #12, *ex*: flight intercept trap (KSEM, 1); Peru: Dept. Loreto, Campamento San Jacinto 2°18'75"S, 75°51'77"W, 5 July 1993, 175-215 m, Richard Leschen, #31, *ex*: flight intercept trap (MHN, 1); Peru: Dept. Loreto, 1.5 km N. Teniente Lopez, 2°35'66"S, 76°06'92"W, 26 July 1993, 210-240 m, Richard Leschen #211, *ex*: flight intercept trap (KSEM, 1; MHN, 1); Peru: Dept. Loreto, Teniente Lopez, 2°35'66"S, 76°06'92"W, 28 July 1993, 210-240 m, Richard Leschen #199, *ex*: flight intercept trap (KSEM, 1).

Distribution. French Guiana and Peru.

DISCUSSION

When PACE (1996) placed *Amazonopora* in the tribe Diglottini, he mentioned that this placement contradicted his earlier work (1986) on the Diglottini, because his earlier definition of the Diglottini was primarily based on the habitus shape and ecological characteristics. Under this tribal definition, members of the Diglottini (sensu PACE 1986) are confined to the seashores. However, members of *Amazonopora* have only been found lowland tropical rainforests, and one specimen was found in a riparian habitat (flood debris). Nevertheless PACE preferred to continue to place the genus *Amazonopora* to the tribe Diglottini.

Since Myllaenini and Diglottini were erected by GANGLBAUER (1895) and EICHELBAUM (1909) respectively, the classification of these groups has been one of the most complex and confused in the aleocharine systematics. For example, the intertidal genus *Bryothinusa* Casey has been placed in several tribes by various entomologists: tribe Myllaenini by MOORE & LEGNER (1976); the Phytosini by

MOORE (1956) and SEEVERS (1978); and, the Diglottini by PACE (1986) and HAGHEBAERT (1995).

We compared the structure of members of *Amazonopora* to that of most members of the Myllaenini, Pronomaenini, and Diglottini. Our comparative examination revealed a number of similarities between *Amazonopora* and other myllaenine genera, especially with *Bryothinusa* Casey and *Myllaena* Erichson (Table 1). However, it shares few characters with *Diglotta*. We believe that there is considerable evidence that *Amazonopora* is closely related to members of the Myllaenini. Members of *Amazonopora* and the Myllaenini share the following similarities: gland opening on the anterior margin of tergite VII very small; antero-lateral angles of mentum prolonged into spinose processes (see Fig. 7); lacinia of maxilla elongate, slender, with distinctive distribution of spines interdigitating with spinose scales (see Fig. 5); galea shorter and much more slender than lacinia, with distinctive small patch of setae on apex, and without setae on mesal edge; base of galea flexible, allowing galeal base to bend at a right angle; cardo of maxilla very elongate; ligula short and entire; medial pseudopore field narrow, with few or no pseudopores; lateral pseudopore fields of prementum without pseudopores; and, labial palpi elongate and stylate (see Fig. 6).

The single complex of characters shared among members of the Myllaenini, *Amazonopora*, and *Diglotta* is presence of elongated mouthparts and associated with characteristics of the maxilla and labium. However, AHN & ASHE (1996) concluded that these similarities probably resulted from parallelism between the myllaenine lineage and *Diglotta*. The features of the galea and lacinia differ significantly between the myllaenine complex of genera (including *Amazonopora*), and *Diglotta*. For example, unlike members of the myllaenine complex, *Diglotta* has an elongate row of very long setae on the mesal margin of the galea, and lack the unusual distribution of small spines interdigitated with small spine-like scales in the apical half of the lacinia that is a character that is unique to the myllaenine complex of beetles.

Preliminary results of cladistic analysis of the myllaenine genera (K.-J. AHN & J.S. ASHE in preparation) shows that *Amazonopora* is a sister group to *Myllaena* and *Bryothinusa* rather than *Diglotta*. However, our phylogenetic analysis is still under investigation, and it is premature to draw firm conclusions about the relationships of *Amazonopora* among the myllaenine complex until character variation among all pertinent taxa is more clearly understood.

ACKNOWLEDGMENTS

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