

Supplementary Material

Phylogeny of the South American genus *Baripus* (Coleoptera : Carabidae : Broscini) with the description of new mountain species from the northern Patagonia Biogeographic Province

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Characters and character states used in the phylogenetic analysis of *Baripus*

1-Colouration: non-metallic (0); metallic (1).

Head

2-Setae of submentum: four (0); two (1) (Fig. 4); six (2).

3-Tooth of mentum: apex shallowly emarginate (0); deeply emarginate, with lateral projections (1) (Fig. 4); rounded, not emarginate (2).

4-Longitudinal medial carina of glossal sclerite: absent (0); small (1); pronounced (2) (Fig. 5).

5-Number of glossal sclerite setae: two (0) (Fig. 5); four (1).

6-Maxillary palpomeres: slender (1); broad (2).

7-Number of basal stipital setae: two (0); three (1).

8-Antennomeres 4–10: longer than broad (0) (Fig. 6); 2× longer than broad (1); 2.5 to 3× longer than broad (2).

9-Row of posterolateral setae on antennomere 2: absent (0); from middle to apex (1); from base to apex (2) (Fig. 6).

10-Row of posterolateral setae on antennomeres 3–5: absent (0); present (1) (Fig. 6).

11-Frontal grooves: absent (0); shallow (1); deep, thin (2); deep broad (3).

12-Eyes: rounded, not emarginate (0); with emargination in front of antennal insertion (1) (Fig. 7).

13-Supraorbital groove: shallow (0); forming a deep groove (1).

Thorax

14-Setae of pronotum: one (0); two (1); three (2); four (3); five (4); six (5).

15-Prosternal setae: absent (0); present (1).

16-Margin of pronotum: absent (0); incomplete (1); complete (2) (Fig. 8).

17-Margin of pronotum: equal width along its length (0) (Fig. 8); more wide basally (1); more width apically (2)

18-Margin of pronotum: bordered (0) (Fig. 25); not bordered (1) (Fig. 26).

19-Basal foveae of pronotum: absent (1); separated (1) (Fig. 25); joined centrally (2) (Fig. 28).

20-Basal foveae of pronotum: with a convex area between the basal foveae and the margin (0); without convex area (1).

21-Setae of protochanters: two (0); one (1).

22-Protibiae: not expanded externally at apex (0); expanded externally at apex (1).

23-First protarsomere of male: expanded on inner side (0) (Fig. 10); not expanded (1) (Fig. 9); quadrangular (2) (Fig. 11).

24-Squamose setae of male protarsomeres: absent (0) (Fig. 9); restricted to a small patch or few setae on apical margin (1) (Fig. 10); apical (from the middle) (2); over almost entire surface (3) (Fig. 11); just three or four setae on apical margin (4).

25- Female protarsomeres: not expanded on inner side (0); expanded on inner side (1).

Pterothorax

26-Metepimeron: transverse and slender (0); transverse and broad (1); subquadrangular (2).

27-Meso- and metatarsomeres: broad (0); slender (1).

28-Male mesotarsomeres 1–2: without adhesive setae (0); with adhesive setae (1).

29-Lateral row of setae of mesotibiae (mesotibial brush): absent (0); present (1) (Fig. 12).

30-Setae of metafemora: in a row (0); not aligned (1).

31-Elytral epipleura: slender (0); broad (1).

32-Parascutellar stria: isolated from apical portion of stria 1 (0); joined to apical portion of stria 1 (1).

33-Setae on interval 3, 5, and 7: absent (0); present (1).

34-Setae on interval 9: 3–7 (0); 8–17 (1); 19–29 (2); 30–51 (3).

Abdomen

35-Abdominal sterna: smooth (0); with lateral basal sulcus and a shallow fovea on each side (1); with a complete basal sulcus (2).

36-Anal setae: separate centrally (0); not separate (1).

37-Anal setae: two, apical (0); four to eight, apical (1); 10–20 setae only on medial apical half (2); 21–40 setae starting from the base (3).

38-Basal groove of abdominal sterna: absent (0); incomplete, not defined at middle; complete (2).

Male Genitalia

39-Left paramere: setose (0); aetose (1).

40-Basal keel of median lobe: absent (0); present (1) (Fig. 13, Bk).

41-Basal orifice of median lobe: closed dorsally (0) (Fig. 13); open (1).

42-Median lobe, basal expansions: absent (0) (Fig. 13); present (1).

43-Dorsal surface of median lobe: completely sclerotised (0) (Fig. 14); partially sclerotised (1); not sclerotised (2).

44-Lateral apical groove (Lag) of median lobe: absent (0); present, short (1); present, long and straight, always apical (2); present, long and curved, starting laterally on the right side of apex and then dorsally (3) (Fig. 14); present, long and curved, starting dorsally then curving ventrally to the right side (4).

45-Lateral grooves of median lobe: absent (0); present, curved (1).

46-Ventral groove of median lobe: absent (0); slender (1); broad (2).

47-Ventral groove of median lobe: restricted to ventral region (0); starting ventrally near the base and curved to the right side and opening completely at middle of median lobe (1) (Fig. 30, 32, 34, 36).

48-Mucro in medial region of left basal surface of median lobe: absent (0); present, as 'a notch' (Fig. 30, 32 – M) (1), as conical tooth (2) (Fig. 36 – M).

49-Ventral doubling of ostium of median lobe: absent (0); present (1).

50-Ostium of median lobe: long and broad dorsolateral (0) (Fig. 13); broad, left lateral (1); small, dorsoapical (2); small, left lateral (3).

51-Apex of the median lobe: wide, subquadrate, same width all along (0) (Fig. 29–34); sharpened progressively to apex (1) (Fig. 15); apex with a small tooth (Fig. 13 – A) (2); spatulate, apical portion wider (3) (Fig. 35, 36).

52-Tooth of internal sac: absent (0); present, conical, broad (1) (Fig. 13, 14, 16 – Th); present, spatulate (2); present, conical, slender (3); present, short (4); present, conical, very long (5).

53-Sclerite α of internal sac: absent (0); present, formed by unfused spiculae (1) (Fig. 13, As); formed by fused spiculae (2).

54-Apical plate of internal sac: present (0); absent (1).

55-Sclerites X and Y of internal sac: present (0); absent (1).

56-Internal sac eversion: from the dorsum (0); from the left (1).

Female genital tract

57-Median oviduct union on bursa copulatrix: apical (0) (Fig. 18); basal (1) (Fig. 17, 19, 20).

58-Spermathecal union on bursa copulatrix: sessile (0); with median oviduct (1) (Fig. 17, 18).

59-Accessory gland of bursa copulatrix: present (0); absent (1).

60-Pocket of apex of bursa copulatrix: absent (0); small, with a portion sclerotised (1) (Fig. 18, 19 – P); long, completely sclerotised (2) (Fig. 20)

61-Gonopod VIII: long and slender (0); short (1); long and broad (2); absent (3).

62-Helminthoid sclerite: absent (0); present (1).

Data matrix of species of *Baripus* and outgroups

Missing characters are coded as '?', not comparable with '-' and polymorphic ones are within brackets.

xread

"62 32

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Creobius 1120100100000401000-00220001000101100010112000-000000110010031
Cascellius 1120100100001102000-00220001000100100110112000-000200110010031
parallelus 0112001011010312000-00100000010000200211001000-000000110011011
bonvouloiri 0112001011010312000-00100000010000200211001000-000000110011011
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pulchellus 1012001021211212001001101110010001201211000100-001221111011021
speciosus 1012011021311512001001100100010001201211000100-001221111011021
aequicostis 101201102131151200100110?100010001201211000100-001221111?????
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calchaquensis 1012001021211212001001100100010001201211000100-001232111011021
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cc - 0.61;

proc /;

optcode u 0.61;

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cn {0 coloration nonmetallic metallic;

{1 Setae_of_submentum four two six;

{2 tooth_of_mentum_apex_shallowly_emarginate emarginate_deep,_with_lateral_projections rounded;

{3 longitudinal_medial_carina_of_glossal_sclerite absent small pronounced;

{4 number_of_glossal_sclerite_setae two four;

{5 maxillary_palpomeres slender broad;

{6 number_of_basal_stipital_setae two three;

{7 antennomeres_4-10 1x_longer_than_broad 2x_longer_than_broad 3_x_longer_than_broad;
 {8 row_posterior_setae_antennomere_2 absent_from_middle_to_apex from_base_to_apex1;
 {9 row_of_posterolateral_setae_of_antennal_segmentes_3-5 absent present;
 {10 frontal_grooves absent shallow deep,_thin deep_broad;
 {11 eyes rounded with_emargination_in_front_of_antennal_insertation;
 {12 surco_supraorbital poco_marcado fuertemente_marcado;
 {13 setae_of_pronotum one two three four five_six;
 {14 prosternal_setae absent present;
 {15 borde_marginal_pronoto ausente incompleto completo;
 {16 borde_marginal igual_ancho_en_toda_su_longitud más_ancho_basalmente más_ancho_apicalmente;
 {17 borde_marginal marginado no_marginado;
 {18 foveas_basales_pronoto ausentes separadas unidas_centralmente;
 {19 fosetas_basales con_zona_convexa_con_respecto_al_marge sin_zona_convexa;
 {20 setae_of_protrochanter two one;
 {21 protibiae not_prolonged_externally_to_a_point_at_apex prolonged_externally;
 {22 first_protarsomere_male expanded_on_inner_side not_expanded quadrangular;
 {23 patch_of_hairs_of_protarsomeres absent apical_(from_the_middle) over_entire_surface restricted_to_a_small_patch
 just_three_or_four_setae_on_the_apical_margin;
 {24 protarsomere_female not_expanded_on_inner_side expanded_on_inner_side;
 {25 metepimeron transverse_and_slender transverse_and_broad subcuadrangular;
 {26 meso_and_metatarsomeres broad slender;
 {27 male_middle_tarsomeres_1-2 without_adhesive_setae with_adhesive_setae;
 {28 lateral_row_of_setae_of_mesotibiae absent present;
 {29 Hind_femur_setae in_a_row not_aligned;
 {30 elytral_epipleura slender broad;
 {31 parascutellar_striole isolated_from_the_apical_portion_of_striae_1 joined_to_the_apical_portion_stria_1;
 {32 setae_of_interval_3,_5_7 absent present;
 {33 setae_of_9th_interval 3-7 8-17 19-29 30-51;
 {34 abdominal_sterna smooth_lateral_basal_sulcus_and_a_shallow_fovea_in_each_side with_a_complete_basal_sulcus;
 {35 anal_setae separate_centrally not_separate;
 {36 anal_setae two,_apical four_to_eight,_apical_ 10-20_setae_only_on_medial_apical_half 21-40_setae_starting_from_the_base_;
 {37 basal_groove_of_abdominal_sterna absent incomplete complete;
 {38 left_paramere setose aetose;
 {39 basal_keel_median_lobe absent present;
 {40 basal_orifice_of_median_lobe closed_dorsally open;
 {41 median_lobe,_basal_expansions absent present;
 {42 dorsal_surface_of_median_lobe completely_sclerotized partially_sclerotized not_sclerotized;
 {43 lateral_apical_groove_of_median_lobe absent short long_and_straight_always_apical
 long_curved_starting_lateral_right_of_apex_and_then_dorsally long_curved_starting_dorsally_then_ventrally_to_the_left;
 {44 lateral_grooves_of_median_lobe absent present,_curved;
 {45 ventral_groove_of_median_lobe absent slender broad;
 {46 ventral_groove_of_median_lobe restricted_to_ventral_region starting_ventrally_near_the_base_and_curved_to_the_right_side_and_op;
 {47 diente_en_la_base_del_lóbulo_medio ausente como_una_muesca como_un_diente_conico;
 {48 ventral_doubling_of_ostium absent present;
 {49 ostium long_and_broad,_dorsolateral broad,_left_lateral small_dorsoapical small,_left_lateral;
 {50 apex_of_median_lobe subcuadrangular,_same_width_from_the_finalization_of_ostium aguzate_progresivamente_to_apex pico_de_aguila
 espatulate,_apex_more_wither_than_anterior_part;
 {51 tooth_of_internal_sac absent conical,_broad spatulate conical_slender short conical,_very_long;
 {52 sclerite_alfa absent present,_spiculae_not_fused present,_spiculae_fused;
 {53 apical_plate present absent;
 {54 sclerites_X_and_Y present absent;
 {55 internal_sac_eversion from_the_dorsum_from_the_left;

{56 median_oviduct_union_on_bursa_copulatrix apical basal;
{57 spermathecal_union_on_bursa_copulatrix sessile with_median_oviduct;
{58 accessory_gland_of_bursa_copulatrix present absent;
{59 pocket_of_apex_of_bursa_copulatrix absent small,_partially_sclerotized long,_completely_sclerotized;
{60 gonopod_VIII long_and_slender short long_and_broad absent;
{61 helmintoid_sclerite present absent;
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