

Supplementary Information for

Molecular phylogeny of mega-diverse *Carabus* attests Miocene evolution of alpine environments in the Himalayan-Tibetan Orogen

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Supplementary Information Text

Ground beetles as paleoenvironmental proxies

The beetle family Carabidae is one of the most species-diverse faunal groups with more than 40,000 described species worldwide (1). One of the global centers of Carabidae diversity is located in the Himalayan-Tibetan Orogen (HTO) (2). The majority of the species occurring in the HTO are locally endemic to certain massifs, mountain peaks, and valley systems. However, so far, only a single phylogeographic study addresses the evolution and biogeographic history of a ground beetle group from the HTO (3). This study indicates strict endemism of species in certain parts of the Himalayas and long isolation among populations of wingless ground beetles, with individual haplotypes on single mountain slopes and side valleys. Furthermore, winglessness of the species, together with strict preferences to specific humidity and temperature conditions, result in very poor dispersal ability and species-specific elevational limits, with deep valleys and dry slopes representing effective distributional barriers (4, 5). Consequently, the distribution of extant species and haplotypes of flightless ground beetle groups in the HTO allow robust conclusions about the local spatio-temporal history of the paleoenvironments in the course of the changing topography and climate of the HTO system (6-8).

Moreover, ground beetles are a phylogenetically old group of organisms that started to diversify at the beginning of the Cretaceous period (9, and references therein). Since modern genera of extratropical ground beetles of today's HTO are common in Paleogene fossil deposits of the pre-Palearctic region (10-12), it can be assumed that they colonized (and radiated in) the HTO as soon as it was uplifted to extratropical altitudes. The significant surface uplift in the HTO led to the development of high-altitude environments suitable for these ground beetles. Therefore, the uplift time – associated with the emergence of temperate habitats – should correspond to the first immigration of ancestral species that were pre-adapted to temperate climates. In response to the high-altitude conditions, the majority of ground beetle lineages evolved towards winglessness, i.e., from strong dispersers (fully winged ancestral species) to very weak dispersers (flightless descendant species). The ability to fly was the fundamental premise for colonizing the HTO by ancestral lineages from the Cenozoic Boreal (4, 13). Subsequent development of winglessness triggered the evolution of endemic lineages and their geographic isolation in the course of the topographic changes of the HTO (3). Thus, deep phylogenetic splits of endemic Himalayan ground beetle lineages can be highly informative on the environmental and uplift history of the mountain system.

One of the characteristic elements of the ground beetle fauna in the HTO is the mega-diverse Holarctic genus *Carabus*. Based on the latest revisions of the fossil data and secondary calibration points, the split of *Carabus* from its sister taxon *Calosoma* was estimated to the Late Cretaceous or early Paleogene (14, 15). The genus *Carabus* originated from the Cenozoic pre-Palearctic region (16). This taxon comprises almost 1,000 described extant species, all of which are distributed in the warm-temperate to subarctic zones, with the far most of them occurring in the Palearctic region and in the HTO, a hotspot of species diversity (2, 17). Most *Carabus* beetles are of large body size, flightless, but good runners on the ground surface of different habitats, including high mountains up to the alpine zone (18-20).

The *Carabus* fauna of the HTO shows a geographical distribution pattern that is strongly linked to mountain topography (Figures 2, 3). About 20 subgenera of *Carabus* are known to occur along the eastern Tibetan Plateau margin. None of these subgenera can be found in the Greater Himalaya, except for one (21): *Neoplesius* is the only Tibetan *Carabus* subgenus characterized by a trans-Tibetan distribution spanning from Qinghai in the north to the northern face of the Greater Himalaya in the south. The Himalayan *Carabus* fauna is strictly endemic. Notably, the species diverse subgenus *Imaibius* is distributed in the western Himalaya with by far the most species occurring in the Kashmir region and two local endemic species occurring in disjunct areas in western-central Nepal (17, 22; Figure 3). Further, species of the diverse lineage *Meganebrius* are distributed in a small part of the Greater Himalaya between the Dhaulagiri Himal in the West and the Kangchenjunga Himal in the East (17, 23; Figure 4). Two additional species, previously assigned to the subgenus *Meganebrius*, are found in far separated areas: the polytypic *Carabus scheibei* in the northern part of the Kashmir Himalaya, and the polytypic *C. alanstivelli* in the Far West of Nepal

(Figure 3). Most strikingly, not a single *Carabus* taxon occurs in the eastern area of the Greater Himalaya east of Kangchenjunga. There is an enigmatic wide gap in the *Carabus* distribution between the transverse valleys of Tista River in the West and Brahmaputra in the East (Figure 3). The Central Himalaya hotspot of *Carabus* diversity ends abruptly on the southern face of Kangchenjunga Himal, while the above-mentioned East Tibet hotspot of *Carabus* diversity starts instantly east of the Brahmaputra transverse valley (17, 21). These gaps cannot be explained by the current ecological conditions in the area. Such distributional patterns cannot be found in plants, birds, butterflies, and other species groups with high dispersal power since their current distributions reflect more or less strongly the current climatic conditions in the HTO (overview in 24). Such marked distributional disjunctions are, however, a common phenomenon in HTO ground beetles, and spatio-temporal differences in the surface uplift and resulting paleoenvironments are hypothesized as the ultimate causes (3, 4, 13). Understanding the phylogeographic history of Himalayan-Tibetan *Carabus* by considering the ecological information gained from the species-specific habitat preferences and vertical distributions can offer new insights into the spatio-temporal development of HTO paleoenvironments.

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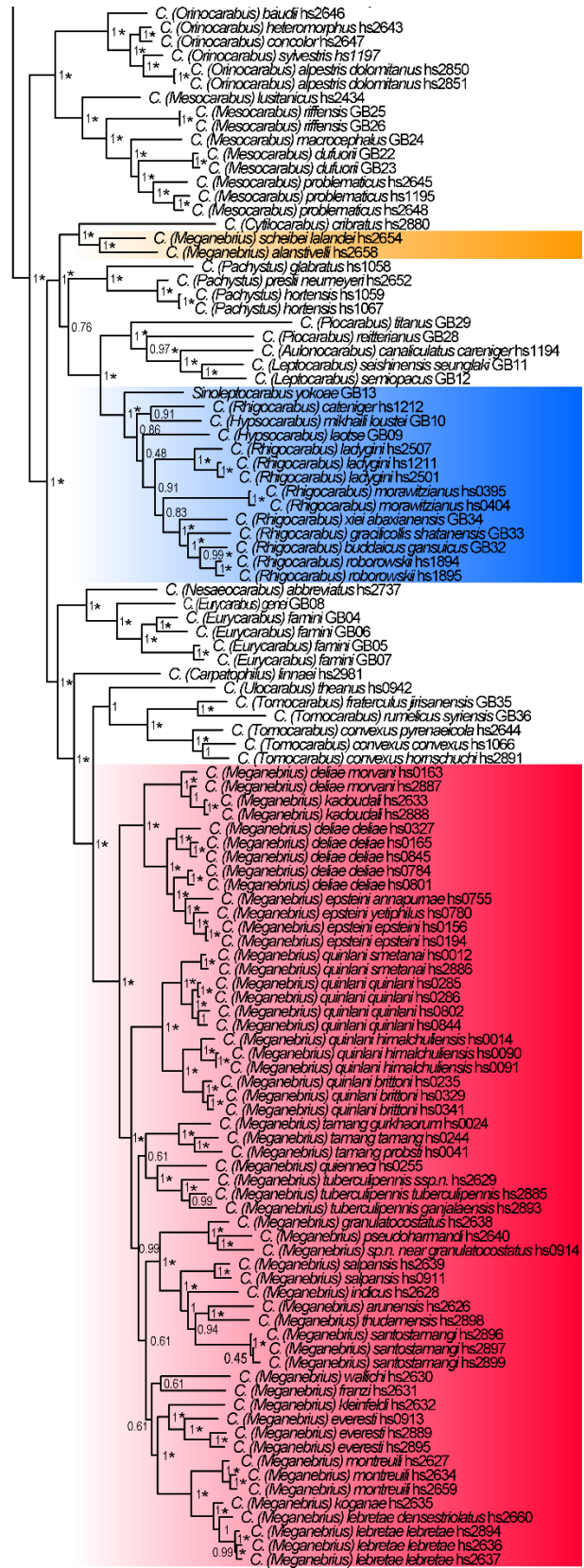
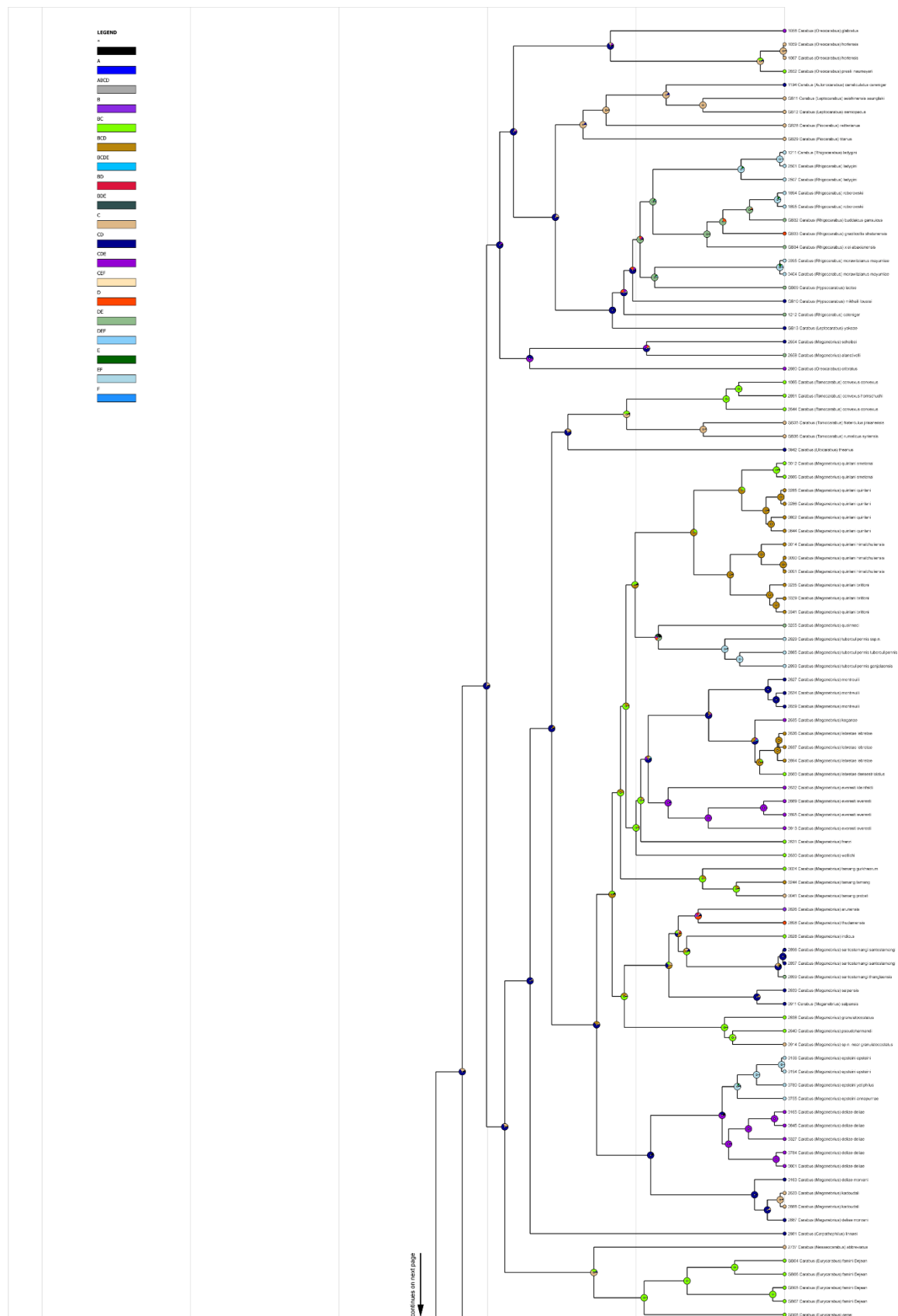


Figure S1. Consensus tree inferred with MrBayes based on the concatenated sequence data of *Carabus* beetles and outgroups. Lineages endemic to certain parts of the HTO are highlighted by the same color code as in Figure 2. Black rectangles and stars at branch nodes refer to posterior probabilities ≥ 0.98 and bootstrap values > 70.0 , respectively.



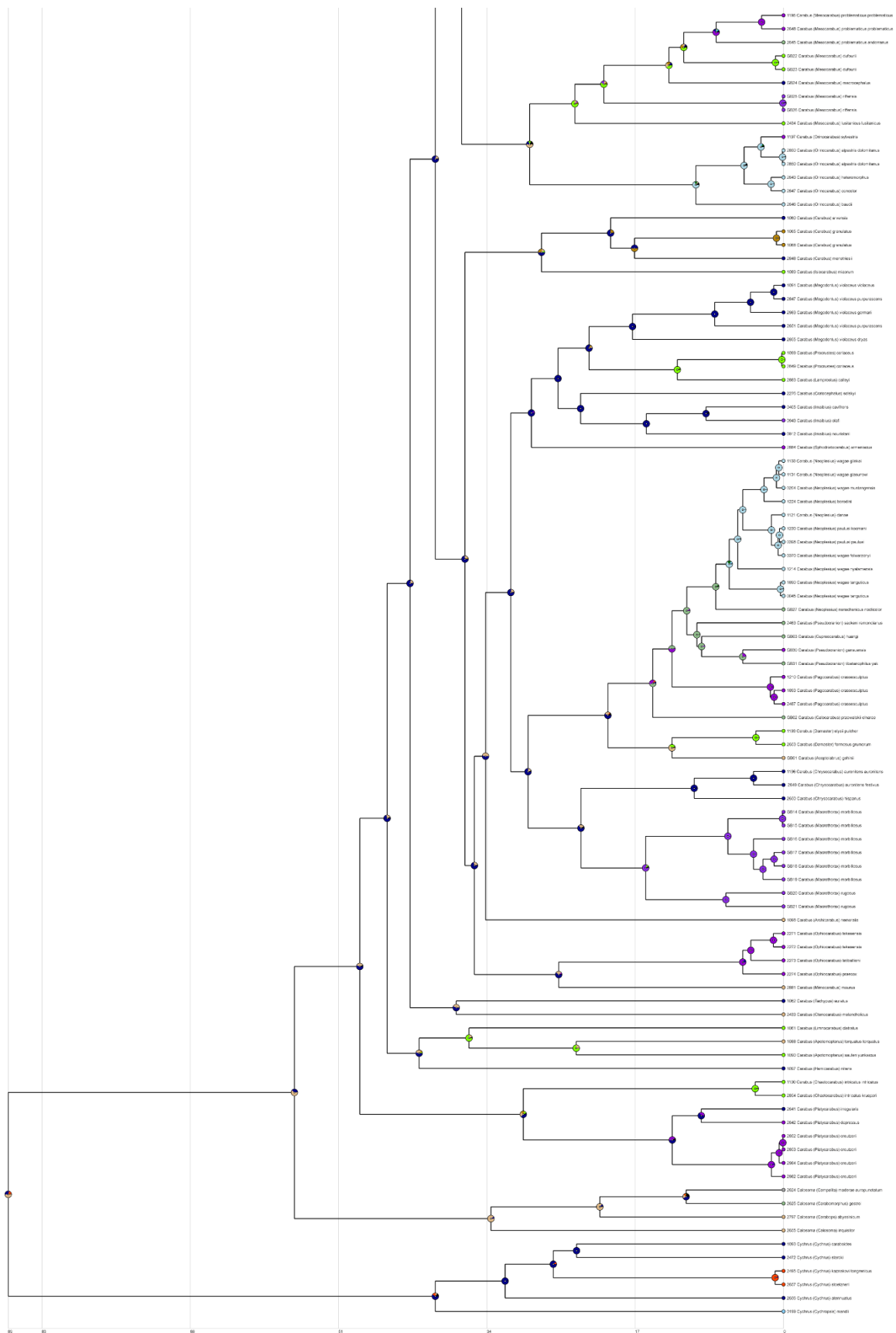


Figure S2. Ancestral area reconstruction based on the BBM method in RASP. Pie charts on each node of the tree indicate marginal probabilities for each alternative ancestral area. Letters and colors in the legend refer to extant and possible ancestral areas, and combinations of these.

Table S1. Eocene to Miocene fossil data from the Himalaya-Tibet Orogen and associated paleoelevational belts.

Age (Ma)	Locality	Paleoelevation	Paleoelevational belt	Proxy	Method	Source
40-37	Hoh Xil basin	< 2000 m	subtropical, dry	pollen record	comparison with recent floras	[1]
39.5 (previously dated to 26-23.5)	Lunpola basin	~ 1000 m	tropic-subtropic	fossil fishes and flora	comparison with recent fauna and floras	[2, 3]
39.5 (previously dated to 26-23.5)	Lunpola basin	< 2300 m	tropic-subtropic	fossil palm leaves	CLAMP	[3, 4]
38	Xining basin	“high”	warm temperate	pollen record	comparison with recent floras	[5]
35	Markam basin	2640–2900 m	subtropical to warm temperate	fossil forest flora	CLAMP	[6]
34.7-33.4	Markam basin	3085 ± 910 m	temperate	fossil forest flora	CLAMP	[6]
30.8	Qaidam basin	3300 ± 1400 m	temperate	fossil forest flora	CLAMP	[7]
26-23.5	Nima basin	~ 1000 m	tropic-subtropic	fossil fishes and flora	comparison with recent fauna and flora	[2]
25.5-19.8	Lunpola basin	max. 3190 ± 100 m	tropic to temperate	pollen record	CA	[8]
23.3	Kailas basin	1500–2900 m	warm temperate	fossil forest flora	CA	[9]
22	Shuanghe Formation at Jianchuan	-	subtropic	fossil forest flora	CA, LMA	[10]
21-19	Qiabulin basin	2300 +/- 900 m	warm temperate	fossil forest flora	CLAMP	[11]
15	Namling-Oiyug basin	3791–5584 m	cold temperate	fossil forest flora	CLAMP	[12]
15	Namling-Oiyug basin	2500–3000 m	cold temperate	fossil forest flora	CA	[13]
15	Namling-Oiyug basin	~ 5400 m	cold temperate	fossil forest flora	CLAMP	[14]
10,8-7,2	Gyirong Basin: Danzengzhukang Formation	< 3000 m	subtropical to warm temperate	palynological data, <i>Hipparion</i> fauna, C4 grasses	review multiple fossil data	[15]
7,2-3,2	Gyirong Basin: lower Woma formation	variable topography: 2000–4500 m	warm temperate to subalpine	palynological data, ostracod fauna	review multiple fossil data	[15]

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Table S2. List of *Carabus* and outgroup species used in this study with taxonomic information, sampling localities and voucher numbers.

	Locality data	coordinates	ID
<i>Calosoma (Calosoma) inquisitor</i> (L.)	GREECE Kefallinia, Sami, alt. 50 m	38°15'N 20°39'E	hs2655
<i>Calosoma (Campalita) maderae auropunctatum</i> (Herbst)	GERMANY Mecklenburg, Boizenburg, Nostorf, alt. 10 m	53°25'N 10°36'E	hs2624
<i>Calosoma (Carabomorphus) gestroi</i> Breuning	ETHIOPIA Bale Mts., Fincha Habera, alt. 3500 m	07°00'N 39°43'E	hs2625
<i>Calosoma (Carabops) abyssinicum</i> Gestro	ETHIOPIA Oromia, Mt. Kaka, alt. 3420 m	07°24'N 39°12'E	hs2797
<i>Carabus (Apotomopterus) sauteri yunkaicus</i> Deuve	CHINA Guangxi, Maoer Shan, alt. 900 m	25°52'N 110°29'E	hs1090
<i>Carabus (Apotomopterus) t.orquatus torquatus</i> Cavazzuti	CHINA Guangxi, Maoer Shan, alt. 900 m	25°52'N 110°29'E	hs1088
<i>Carabus (Archicarabus) nemoralis</i> Müller	GERMANY Mecklenburg, Admannshagen, alt. 8 m	54°08'N 11°59'E	hs1098
<i>Carabus (Aulonocarabus) canaliculatus careniger</i> Chaudoir	CHINA Hebei, Wuling Shan, alt. 1600 m	40°35'N 117°29'E	hs1194
<i>Carabus (Carabus) arvensis</i> Herbst	GERMANY Mecklenburg, Gölde nitzer Moor, alt. 40 m	54°00'N 12°19'E	hs1060
<i>Carabus (Carabus) granulatus</i> L.	GERMANY Mecklenburg, Admannshagen, alt. 8 m	54°08'N 11°59'E	hs1065
<i>Carabus (Carabus) granulatus</i> L.	GERMANY Mecklenburg, Rostock, Rosenort, alt. 1 m	54°14'N 12°11'E	hs1068
<i>Carabus (Carabus) menetriesi</i> Faldermann	GERMANY Bavaria, NP Bayerischer Wald, Spiegelau, Gr. Filz, alt. 757 m	48°55'N 13°24'E	hs2848
<i>Carabus (Carpatophilus) linnaei</i> Panzer	ITALY Trentino, Passo Rolle S-slope, alt. 1700 m	46°17'N 11°48'E	hs2981
<i>Carabus (Chaetocarabus) intricatus intricatus</i> L.	GERMANY, Biosphärenreservat Pfälzerwald, „Schmaler Hals“, alt. 550 m	49°14'N 07°48'E	hs1100
<i>Carabus (Chaetocarabus) intricatus krueperi</i> Reitter	GREECE Pieria, Ano Milia, alt. 1200 m	40°14'N 22°14'E	hs2854
<i>Carabus (Chrysocarabus) auronitens auronitens</i> Fabricius	GERMANY Saxonia, Schwarzwasser Valley, Kühnhaide to Pobershau, alt. 670 m	50°37'N 13°14'E	hs1196
<i>Carabus (Chrysocarabus) auronitens festivus</i> Dejean	FRANCE Tarn, Montagne Noire, SW of Mazamet, alt. 900 m	43°28'N 02°14'E	hs2649
<i>Carabus (Chrysocarabus) hispanus</i> Fabricius	FRANCE Cévennes, Lozère, N of Mont Aigoual, alt. 1150 m	44°11'N 03°31'E	hs2650
<i>Carabus (Cratocephalus) solskyi</i> Ballion	CHINA Xinjiang, Narat Mt. Range, Erbotu Valley, alt. 1915 m	43°06'N 83°00'E	hs2276
<i>Carabus (Ctenocarabus) melancholicus</i> Fabricius	SPAIN Sierra de Gredos, valley above Gavilanes, alt. 1100 m	40°16'N 04°51'W	hs2433
<i>Carabus (Cytlocarabus) cribratus</i> Quensel	ARMENIA Aragatso tn, Mt. Aragatso tn, alt. 2700 m	40°30'N 44°15'E	hs2880
<i>Carabus (Damaster) elysii pulcher</i> Kleinfeld	CHINA Henan Prov., Jigong Shan, 700 m	31°81'N 114°08'E	hs1193
<i>Carabus (Damaster) formosus grumorum</i> Semenov	CHINA Sichuan, Ganze, alt. 3460 m	31°40'N 99°44'E	hs2653
<i>Carabus (Hemicarabus) nitens</i> L.	GERMANY Mecklenburg, Gölde nitzer Moor, alt. 40 m	54°00'N 12°19'E	hs1097
<i>Carabus (Imaibius) cavifrons</i> Mandl	NEPAL Jumla, Gothichaur Valley, alt. 2900 m	29°10'N 82°22'E	hs0405
<i>Carabus (Imaibius) nouristani</i> Ledoux	AFGHANISTAN Pashinkanda, Darah-I-Nur, 40 km NE Jalalabad, alt. 3000 m	34°45'N 70°40'E	hs0912
<i>Carabus (Imaibius) olafi</i> Deuve & Schmidt	NEPAL Myagdi, Baglung Lekh, 10 km W Baglung alt. 2400 m	28°19'N 83°32'E	hs0943
<i>Carabus (Isiocarabus) miaorum</i> Lassalle & Prunier	CHINA Guangxi, Maoer Shan, alt. 900 m	25°52'N 110°29'E	hs1089
<i>Carabus (Lamprostus) calleyi</i> Fischer	ARMENIA Vayots Dzor, W-slope Vorotan-Pass, alt. 2250 m	39°41'N 45°42'E	hs2883
<i>Carabus (Limnocarabus) clatratus</i> L.	GERMANY Mecklenburg, Gölde nitzer Moor, alt. 40 m	54°00'N 12°19'E	hs1061
<i>Carabus (Meganebrius) alanstivelli</i> Morvan	NEPAL Bahjura, 44 km NE Chainpur, alt. 3900 m	29°48'N 81°30'E	hs2658
<i>Carabus (Meganebrius) arunensis</i> Heinertz	NEPAL, Arun Valley, Sankhuwasabha, Chichila, alt. 1900 m	27°28'N 87°14'E	hs2626

<i>Carabus (Meganebrius) deliae deliae</i> Morvan	NEPAL S-slope Dhaulagiri Himal, Lete Pass, alt. 4150m	28°35'N 83°35'E	hs0784
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	NEPAL Kali Gandaki Vall. to Nilgiri Himal, above Sauru, alt. 3650 m	28°40'N 83°39'E	hs0801
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	NEPAL S-slope Annapurna South Himal, Ghorepani, alt. 2800 m	28°24'N 83°42'E	hs0165
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	NEPAL S-slope Annapurna South Himal, NW Tadapani, alt. 3300 m	28°24'N 83°45'E	hs0845
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	NEPAL SE-slope Lamjung Himal, below Sundar Danda alt. 3400 m	28°24'N 84°21'E	hs0327
<i>Carabus (Meganebrius) deliae morvani</i> Lassalle	NEPAL SW-slope Dhaulagiri Himal, E-slope of Jaljala Pass, alt. 3000 m	28°31'N 83°15'E	hs2887
<i>Carabus (Meganebrius) deliae morvani</i> Lassalle	NEPAL Myagdi, Baglung Lekh, 30 km W Baglung, alt. 2900 m	28°22'N 83°20'E	hs0163
<i>Carabus (Meganebrius) epsteini annapurnae</i> Deuve & Schmidt	NEPAL S-slope of Annapurna South Himal, above Khopra, alt. 4100 m	28°29'N 83°44'E	hs0755
<i>Carabus (Meganebrius) epsteini epsteini</i> Heinertz	NEPAL Kali Gandaki Valley, Yakkharka above Marpha, alt. 3750 m	28°45'N 83°39'E	hs0194
<i>Carabus (Meganebrius) epsteini epsteini</i> Heinertz	NEPAL Kali Gandaki Vall. to Nilgiri South Himal, Thulo Bugin, alt. 4000 m	28°37'N 83°41'E	hs0156
<i>Carabus (Meganebrius) epsteini yetiphilus</i> Deuve & Schmidt	NEPAL S-slope of Dhaulagiri Himal, Lete Pass, alt. 4150m	28°35'N 83°35'E	hs0780
<i>Carabus (Meganebrius) everesti everesti</i> Andrewes	NEPAL Bhojpur, Bilbate E of Salpa Pass, alt. 2800 m	27°25'N 86°57'E	hs0913
<i>Carabus (Meganebrius) everesti everesti</i> Andrewes	NEPAL Solu Khumbu, Taktor W Junbesi, alt. 3100 m	27°35'N 86°31'E	hs2889
<i>Carabus (Meganebrius) everesti everesti</i> Andrewes	NEPAL Dolakha, NW Jiri, alt. 2860 m	27°41'N 86°14'E	hs2895
<i>Carabus (Meganebrius) everesti kleinfeldi</i> Korell	NEPAL Helambu, Paanch Pokhari Lekh, Hile Kharka, alt. 3600 m	27°59'N 85°44'E	hs2632
<i>Carabus (Meganebrius) franzi</i> Mandl	NEPAL Helambu, Paanch Pokhari Lekh, above Kamikharka, alt. 3000 m	27°53'N 85°42'E	hs2631
<i>Carabus (Meganebrius) granulatocostatus</i> Mandl	NEPAL, Solu Khumbu, below Najing, alt. 2650 m	27°34'N 86°48'E	hs2638
<i>Carabus (Meganebrius) indicus</i> Fairmaire	NEPAL, Taplejung Distr., Panduwa Bhanjyang, alt. 3720 m	27°23'N 88°01'E	hs2628
<i>Carabus (Meganebrius) kadoudali</i> Morvan	NEPAL W-slope Dhaulagiri Himal, Thankur, alt. 3250 m	28°36'N 83°01'E	hs2888
<i>Carabus (Meganebrius) kadoudali</i> Morvan	NEPAL S-slope Dhaulagiri Himal, W-slope of Jaljala Pass, alt. 3400 m	28°31'N 83°13'E	hs2633
<i>Carabus (Meganebrius) koganae</i> Colas	NEPAL Solu Khumbu, S Dudh Kund, alt. 4300 m	27°41'N 86°35'E	hs2635
<i>Carabus (Meganebrius) lebreatae densestriolatus</i> Mandl	NEPAL Dolakha, Tingsang La, alt. 3030 m	27°49'N 86°00'E	hs2660
<i>Carabus (Meganebrius) lebreatae lebreatae</i> Colas	NEPAL Solu Khumbu, Taktor W Junbesi, alt. 3100 m	27°35'N 86°31'E	hs2636
<i>Carabus (Meganebrius) lebreatae lebreatae</i> Colas	NEPAL, Ramechhap, between Likhu Khola and Khimti Khola, alt. 2800 m	27°35'N 86°20'E	hs2637
<i>Carabus (Meganebrius) lebreatae lebreatae</i> Colas	NEPAL Dolakha, upper Khimti Khola Vall. alt. 3180m	27°42'N 86°20'E	hs2894
<i>Carabus (Meganebrius) montreuili</i> Deuve	NEPAL Solu Khumbu, Surkie La, alt. 3000 m	27°34'N 86°49'E	hs2634
<i>Carabus (Meganebrius) montreuili</i> Deuve	NEPAL Solu Khumbu, Majang Khola, alt. 3580 m	27°38'N 86°49'E	hs2659
<i>Carabus (Meganebrius) montreuili</i> Deuve	NEPAL Sankhuwasabha, Arun Vall. to Makalu, Dhara Kharka, alt. 2935 m	27°38'N 87°13'E	hs2627
<i>Carabus (Meganebrius) pseudoharmandi</i> Mandl	NEPAL Sankhuwasabha, Arun Valley to Makalu, Nagala Kharka, alt. 2530 m	27°40'N 87°18'E	hs2640
<i>Carabus (Meganebrius) queinneci</i> Deuve	NEPAL Ganesh Himal, Pansang Danda, alt. 3820 m	28°09'N 85°10'E	hs0255
<i>Carabus (Meganebrius) quinlani himalchuliensis</i> Lassalle	NEPAL S-slope Manaslu Himal, Dudh Pokhari Lekh, alt. 2900 m	28°18'N 84°35'E	hs0090
<i>Carabus (Meganebrius) quinlani himalchuliensis</i> Lassalle	NEPAL S-slope Manaslu Himal, Dudh Pokhari Lekh, alt. 2900 m	28°18'N 84°35'E	hs0091
<i>Carabus (Meganebrius) quinlani himalchuliensis</i> Lassalle	NEPAL S-slope Manaslu Himal, Bara Pokhari, alt. 3100 m	28°18'N 84°28'E	hs0014
<i>Carabus (Meganebrius) quinlani brittoni</i> Mandl	NEPAL N-slope Lamjung Himal, Temang, alt. 2670 m	28°32'N 84°18'E	hs0235

<i>Carabus (Meganebrius) quinlani brittoni</i> Mandl	NEPAL SE-slope Lamjung Himal, below Sundar Danda alt. 2400m	28°22'N 84°22'E	hs0341
<i>Carabus (Meganebrius) quinlani brittoni</i> Mandl	NEPAL SE-slope Lamjung Himal, below Sundar Danda alt. 3400 m	28°24'N 84°21'E	hs0329
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	NEPAL S-slope Annapurna II Himal, Sikles, alt. 2050 m	28°21'N 84°06'E	hs0285
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	NEPAL SW-slope Lamjung Himal, Bachhar Kharka, alt. 2380 m	28°22'N 84°08'E	hs0286
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	NEPAL S-slope Annapurna South Himal, NW Tadapani, alt. 3300 m	28°24'N 83°45'E	hs0844
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	NEPAL Kali Gandaki Vall. to Nilgiri Himal, above Sauru, alt. 3650 m	28°40'N 83°39'E	hs0802
<i>Carabus (Meganebrius) quinlani smetanai</i> Häckel & Brezina	NEPAL Myagdi, Baglung Lekh, above Okhle, alt. 2450 m	28°18'N 83°29'E	hs0012
<i>Carabus (Meganebrius) quinlani smetanai</i> Häckel & Brezina	NEPAL SW-slope Dhaulagiri Himal, Dhorpatan, alt. 2900 m	28°29'N 83°06'E	hs2886
<i>Carabus (Meganebrius) salpansis</i> Deuve	NEPAL Bhojpur, Lawari Kharka alt. 3250 m	27°23'N 86°55'E	hs0911
<i>Carabus (Meganebrius) salpansis</i> Deuve	NEPAL Sankhuwasabha, Arun Valley to Makalu, Bawala Pass, alt. 4200 m	27°43'N 87°15'E	hs2639
<i>Carabus (Meganebrius) santostamangi santostamangi</i> Deuve & Schmidt	NEPAL Taplejung, Palung Khola, alt. 3100 m	27°35'N 87°41'E	hs2896
<i>Carabus (Meganebrius) santostamangi santostamangi</i> Deuve & Schmidt	NEPAL Taplejung, E-slope Palung Khola Vall., alt. 3720 m	27°36'N 87°42'E	hs2897
<i>Carabus (Meganebrius) santostamangi thanglaensis</i> Deuve & Schmidt	NEPAL Sankhuwasabha/Taplejung, Thangla Phedi alt. 4150 m	27°39'N 87°36'E	hs2899
<i>Carabus (Meganebrius) scheibei</i> Eidam	PAKISTAN Dir, Hindukush, Lawarai Pass, alt. 3200 m	35°21'N 71°48'E	hs2654
<i>Carabus (Meganebrius) sp.n. near granulocostatus</i>	NEPAL Bhojpur, Bilbate E of Salpa Pass, alt. 2800 m	27°25'N 86°57'E	hs0914
<i>Carabus (Meganebrius) tamang gurkhaorum</i> Lassalle	NEPAL S-slope Manaslu Himal, south below Bara Pokhari, alt. 2200 m	28°16'N 84°26'E	hs0024
<i>Carabus (Meganebrius) tamang probsti</i> Deuve	NEPAL NE-slope Manaslu Himal, above Prok, alt. 2950 m	28°31'N 84°50'E	hs0041
<i>Carabus (Meganebrius) tamang tamang</i> Deuve	NEPAL Ganesh Himal, Pansang Danda, alt. 3820 m	28°09'N 85°10'E	hs0244
<i>Carabus (Meganebrius) thudamensis</i> Deuve & Schmidt	NEPAL Sankhuwasabha, Thudam, alt. 3860 m	27°45'N 87°33'E	hs2898
<i>Carabus (Meganebrius) tuberculipennis ganjalaensis</i> Deuve	NEPAL Helambu, near Kanja La pass, alt. 4500 m	28°06'N 85°34'E	hs2893
<i>Carabus (Meganebrius) tuberculipennis ssp.n.</i>	NEPAL Helambu, Paanch Pokhari, alt. 4100 m	28°03'N 85°43'E	hs2629
<i>Carabus (Meganebrius) tuberculipennis tuberculipennis</i> Mandl	NEPAL Helambu, S Gosainkund, Gyaje Kharka, 3900 m	28°04'N 85°27'E	hs2885
<i>Carabus (Meganebrius) wallichi</i> Hope	NEPAL Helambu, Paanch Pokhari Lekh, Dshungel Camp, alt. 2800 m	27°52'N 85°42'E	hs2630
<i>Carabus (Megodontus) germarii</i> Sturm	ITALIA Trentino, above Passo Rolle, 2070 m	46°18'N 11°49'E	hs2983
<i>Carabus (Megodontus) violaceus dryas</i> Gistel	GREECE above Pieria, alt. 1800 m	40°16'N 22°12'E	hs2855
<i>Carabus (Megodontus) violaceus purpurascens</i> Fabricius	UK, Devon, Dartmoor, Dendles Wood, alt. 220 m	50°26'N 03°57'W	hs2847
<i>Carabus (Megodontus) violaceus purpurascens</i> Fabricius	FRANCE Hautes-Pyrénées, Col d'Aspin, alt. 1500 m	42°56'N 00°19'E	hs2651
<i>Carabus (Megodontus) violaceus violaceus</i> L.	GERMANY Mecklenburg, Rostock, Rosenort, alt. 1 m	54°14'N 12°11'E	hs1091
<i>Carabus (Mesocarabus) lusitanicus lusitanicus</i> Fabricius	SPAIN Sierra de Guadarrama, E Puerto de los Cotos, alt. 1700 m	40°50'N 03°57'W	hs2434
<i>Carabus (Mesocarabus) problematicus andorranus</i> Lapouge	ANDORRA Port d'Envalira, alt. 2400 m	42°32'N 01°43'E	hs2645
<i>Carabus (Mesocarabus) problematicus problematicus</i> Herbst	GERMANY Thüringen, Schellroda, alt. 450 m	50°55'N 11°06'E	hs1195
<i>Carabus (Mesocarabus) problematicus problematicus</i> Herbst	FRANCE Cévennes, Lozère, N of Mont Aigoual, alt. 1150 m	44°11'N 03°31'E	hs2648
<i>Carabus (Mimocarabus) maurus</i> (Adams)	ARMENIA Aragatsotn, Mt. Aragatsotn, alt. 2700 m	40°30'N 44°15'E	hs2881
<i>Carabus (Neoplesius) borodini</i> Heinz	CHINA South Tibet, Gangdise Shan, above Mila, alt. 5100 m	29°50'N 92°21'E	hs1224

<i>Carabus (Neoplesius) danae</i> Kaláb	CHINA South Tibet, Gangdise Shan W Lhasa, Chüsül Valley, alt. 4300 m	29°30'N 90°41'E	hs1121
<i>Carabus (Neoplesius) paulusi kocmani</i> Kaláb	CHINA South Tibet, Gangdise Shan, N Menpa Monastery, alt. 5300 m	30°08'N 92°12'E	hs1230
<i>Carabus (Neoplesius) paulusi paulusi</i> Kaláb	CHINA South Tibet, Gangdise Shan NE Lhasa, Chak La, alt. 5000 m	30°07'N 91°16'E	hs0398
<i>Carabus (Neoplesius) wagae folwarcznyi</i> Deuve	CHINA South Tibet, Nyainqentanglha Shan, Shogu Tsu Vall., alt. 4700 m	29°56'N 90°14'E	hs0370
<i>Carabus (Neoplesius) wagae glasunowi</i> Heinz	CHINA South Tibet, Tibetan Himalaya, Karola, alt. 5000 m	28°54'N 90°09'E	hs1131
<i>Carabus (Neoplesius) wagae glinkai</i> Heinz	CHINA South Tibet, Tibetan Himalaya, Kampa La, alt. 4800 m	29°12'N 90°37'E	hs1103
<i>Carabus (Neoplesius) wagae mustangensis</i> Deuve	NEPAL N-slope Annapurna Himal, south above Muktinath, alt. 4350 m	28°48'N 83°52'E	hs0204
<i>Carabus (Neoplesius) wagae nyalamensis</i> Deuve	CHINA South Tibet, N-slope Greater Himalaya, S of Nyalam, alt. 4000 m	28°09'N 85°58'E	hs1214
<i>Carabus (Neoplesius) wagae tanguticus</i> Semenov	CHINA Qinghai, Barganxiang, Gangbo N, alt. 4250 m	33°58'N 96°34'E	hs1890
<i>Carabus (Neoplesius) wagae wagae</i> Fairmaire	NEPAL N-slope Manaslu Himal, Dharmasala, alt. 4700 m	28°40'N 84°35'E	hs0045
<i>Carabus (Nesaeocarabus) abbreviatus</i> Brullé	SPAIN, Teneriffa, above Orotava, Los Organos, alt. 1200 m	28°21'N 16°30'W	hs2737
<i>Carabus (Ophiocarabus) latiballioni</i> Deuve	CHINA Xinjiang, ESE Tekes, Tagymbel, S Karatogai Vill., alt. 2200 m	43°09'N 82°15'E	hs2273
<i>Carabus (Ophiocarabus) praecox</i> Semenov	CHINA Xinjiang, Narat Mt. Range, Bodon Valley, alt. 3000-3240 m	43°01'N 83°10'E	hs2274
<i>Carabus (Ophiocarabus) tekesensis</i> Deuve & Tian	CHINA Xinjiang, Narat Mt. Range, NE of Tshon-Kushtai, alt. 2635 m	42°56'N 82°15'E	hs2271
<i>Carabus (Ophiocarabus) tekesensis</i> Deuve & Tian	CHINA Xinjiang, Narat Mt. Range, NE of Tshon-Kushtai, alt. 2500 m	42°56'N 82°14'E	hs2272
<i>Carabus (Orinocarabus) alpestris dolomitanus</i> Mandl	ITALY Dolomiti, Rosengarten, Tschagerjoch to Rotwandhütte, alt. 2500 m	46°26'N 11°38'E	hs2850
<i>Carabus (Orinocarabus) alpestris dolomitanus</i> Mandl	ITALY Dolomiti, Schlern, Schlernhaus to Rosenzahncharte, alt. 2500 m	46°30'N 11°37'E	hs2851
<i>Carabus (Orinocarabus) baudii</i> Kraatz	ITALY Piemont, Crissolo, Monviso, Pian del Re, alt. 2600 m	44°42'N 07°05'E	hs2646
<i>Carabus (Orinocarabus) concolor</i> Fabricius	ITALY Valle d'Aosta, Valtourmenche, Promiot to Mt. Zerebiom, alt. 2500 m	45°47'N 07°36'E	hs2647
<i>Carabus (Orinocarabus) heteromorphus</i> Daniel	ITALY Piemont, Gran Paradiso, Col de Nivolet, alt. 2600 m	45°29'N 07°08'E	hs2643
<i>Carabus (Orinocarabus) sylvestris</i> Panzer	GERMANY Saxonia, Schwarzwasser Valley, Kühnhaide to Pobershau, alt. 670 m	50°37'N 13°14'E	hs1197
<i>Carabus (Pachystus) glabratus</i> Paykull	RUSSIA Karelia, White Sea, Kindo Peninsula, alt. 10 m	66°33'N 33°06'E	hs1058
<i>Carabus (Pachystus) hortensis</i> L.	SWEDEN Smaland, near Väckelsång, alt. 150 m	56°35'N 14°55'E	hs1059
<i>Carabus (Pachystus) hortensis</i> L.	GERMANY Mecklenburg, Rostock, Rosenort, alt. 1 m	54°14'N 12°11'E	hs1067
<i>Carabus (Pachystus) preslii neumeyeri</i> Schaum	GREECE Kefallinia, Antisamos, alt. 100 m	38°15'N 20°40'E	hs2652
<i>Carabus (Pagocarabus) crassesculptus</i> Kraatz	CHINA Gansu, Station Tianshu, alt. 2900 m	37°12'N 102°47'E	hs1210
<i>Carabus (Pagocarabus) crassesculptus</i> Kraatz	CHINA Gansu, Aze Station, alt. 3550 m	33°40'N 101°51'E	hs1893
<i>Carabus (Pagocarabus) crassesculptus</i> Kraatz	CHINA Qinghai, road Qingshuihe-Yushu, alt. 4200 m	33°12'N 97°26'E	hs2487
<i>Carabus (Platycarabus) creutzeri</i> Fabricius	ITALY Dolomiti, Schlern, Schlernhaus to Rosenzahncharte, alt. 2500 m	46°30'N 11°37'E	hs2852
<i>Carabus (Platycarabus) creutzeri</i> Fabricius	ITALY Dolomiti, Latemar, Poppekanzel, alt. 2300 m	46°24'N 11°36'E	hs2853
<i>Carabus (Platycarabus) creutzeri</i> Fabricius	ITALY Trentino, Passo Rolle S-slope, alt. 1700 m	46°16'N 11°47'E	hs2982
<i>Carabus (Platycarabus) creutzeri</i> Fabricius	ITALY Trentino, above Passo Rolle, alt. 2070 m	46°17'N 11°48'E	hs2984
<i>Carabus (Platycarabus) depressus</i> Bonelli	ITALY Aosta, Col Gr. San Bernardo, south slope, alt. 2450 m	45°52'N 07°09'E	hs2642
<i>Carabus (Platycarabus) irregularis</i> Fabricius	GERMANY Bayern, Garmisch-Patenkirchen, Alpspitze, alt. 1900 m	47°26'N 11°03'E	hs2641

<i>Carabus (Procrustes) coriaceus</i> L.	GERMANY Mecklenburg, Nienhagen, Ehbruch, alt. 10 m	54°09'N 11°58'E	hs1099
<i>Carabus (Procrustes) coriaceus</i> L.	GERMANY Mecklenburg, Admannshagen, alt. 8 m	54°08'N 11°59'E	hs2849
<i>Carabus (Pseudocranion) sackeni remondianus</i> Deuve	CHINA Sichuan, road E Maoxian-Songpan, 1 km SE Maanyao, alt. 3750 m	32°00'N 103°45'E	hs2463
<i>Carabus (Rhigocarabus) cateniger</i> Morawitz	CHINA Gansu, Pass NW Eboling, alt. 3700 m	38°00'N 100°55'E	hs1212
<i>Carabus (Rhigocarabus) ladygini</i> Semenov	CHINA Qinghai, 5 km SW Pass Bayankala, alt. 4680 m	34°05'N 97°36'E	hs1211
<i>Carabus (Rhigocarabus) ladygini</i> Semenov	CHINA Qinghai, Bayankala pass, alt. 4700 m	34°08'N 97°39'E	hs2501
<i>Carabus (Rhigocarabus) ladygini</i> Semenov	CHINA Qinghai, pass W Mt. Maqen Gangri, alt. 4750 m	34°49'N 99°03'E	hs2507
<i>Carabus (Rhigocarabus) morawitzianus mayumiae</i> Deuve & Imura	CHINA South Tibet, Nyainqentanglha Shan, Gyoze La, alt. 4900 m	30°37' 91°31'E	hs0395
<i>Carabus (Rhigocarabus) morawitzianus mayumiae</i> Deuve & Imura	CHINA South Tibet, Gangdise Shan E Reting, alt. 5100 m	30°25'N 91°41'E	hs0404
<i>Carabus (Rhigocarabus) roborowskii</i> Semenov	CHINA Qinghai, Barganxiang, Gangbo N, alt. 4250 m	33°58'N 96°34'E	hs1894
<i>Carabus (Rhigocarabus) roborowskii</i> Semenov	CHINA Qinghai, 80 km S Darleg, alt. 4400 m	33°09'N 99°38'E	hs1895
<i>Carabus (Sphodristocarabus) armeniacus</i> Mannerheim	ARMENIA Syunik, E-slope Vorotan-Pass, alt. 2330 m	39° 41'N 45°43'E	hs2884
<i>Carabus (Tachypus) auratus</i> L.	GERMANY Mecklenburg, Rostock, Kassebohm, alt. 5 m	54°04'N 12°09'E	hs1062
<i>Carabus (Tomocarabus) convexus convexus</i> Fabricius	GERMANY Sachsen-A., opencast mine Profen, alt. 175 m	51°08'N 12°09'E	hs1066
<i>Carabus (Tomocarabus) convexus pyrenaicola</i> Csiki	FRANCE Hautes-Pyrénées, Col de Hautacam, alt. 1500 m	42°58'N 00°00'E	hs2644
<i>Carabus (Tomocarabus) convexus hornschi</i> Hoppe	GREECE Macedonia, Voras Oros, Kajmakalon, alt. 1800 m	40°54'N 21°50'E	hs2891
<i>Carabus (Ulocarabus) theanus</i> Reitter	AFGHANISTAN Baglan, N-slope Salang Pass, alt. 2200 m	35°27'N 68°59'E	hs0942
<i>Cychrus (Cychropsis) mandli</i> (Paulus)	NEPAL Kali Gandaki Valley, Yakkharka above Marpha, alt. 3750 m	28°45'N 83°39'E	hs0199
<i>Cychrus (Cychrus) attenuatus</i> (Fabricius)	FRANCE Cévennes, dep. Ardèche, Croix de Bauzon, alt. 1200 m	44°38'N 04°05'E	hs2656
<i>Cychrus (Cychrus) caraboides</i> (L.)	GERMANY Mecklenburg, Rostock, Rosenort, alt. 1 m	54°14'N 12°11'E	hs1093
<i>Cychrus (Cychrus) kaznakovi tongrenicus</i> Deuve	CHINA Qinghai, 40 km N Maqen, alt. 3500 m	34°44'N 100°14'E	hs2495
<i>Cychrus (Cychrus) starcki</i> Reitter	ABKHAZIA southern Bertshil mountain range, alt. 1440 m	43°24'N 40°16'E	hs2472
<i>Cychrus (Cychrus) stoetzeri</i> Roeschke	CHINA, Sichuan, Amula hot spring, alt. 3980 m	31°51'N 99°14'E	hs2657

Table S3. List of *Carabus* and outgroup species used in this study with information on gene fragment, voucher and GenBank accession number.

	COI	ND5	ITS2	28S	18S	CAD	wingless	PepCK	HUWE1
<i>Calosoma (Calosoma) inquisitor</i> (L.)	OP756682	OP761311	OP757436	OP758463	OP758644	OP761750	n.a.	OP761608	n.a.
<i>Calosoma (Campalita) maderae auropunctatum</i> (Herbst)	OP756651	n.a.	OP757406	OP758433	OP758614	OP761721	OP761431	OP761581	OP745157
<i>Calosoma (Carabomorphus) gestroi</i> Breuning	OP756652	OP761281	OP757407	OP758434	OP758615	OP761722	OP761432	OP761582	OP745158
<i>Calosoma (Carabops) abyssinicum</i> Gestro	OP756689	OP761316	OP757441	OP758470	OP758651	OP761757	OP761467	OP761613	OP745188
<i>Carabus (Acoptolabus) gehinii</i> Fairmaire	LC553403	D50429	n.a.	LC567590	n.a.	n.a.	AY183606	AY183527	n.a.
<i>Carabus (Apotomopterus) sauteri yunkaicus</i> Deuve	OP756604	OP761235	OP757361	OP758383	OP758564	OP761672	OP761383	OP761535	OP745113
<i>Carabus (Apotomopterus) torquatus torquatus</i> Cavazzuti	OP756602	n.a.	OP757359	OP758381	OP758562	OP761670	OP761381	OP761533	OP745111
<i>Carabus (Archicarabus) nemoralis</i> Müller	OP756608	OP761238	OP757364	OP758387	OP758568	OP761676	OP761386	OP761538	OP745116
<i>Carabus (Aulonocarabus) canaliculatus careniger</i> Chaudoir	OP756614	OP761245	OP757370	OP758394	OP758575	OP761682	OP761393	OP761545	OP745122
<i>Carabus (Calocarabus) przewalskii elnarae</i> Cavazzuti	JQ646585	n.a.	n.a.	JQ647375	n.a.	n.a.	n.a.	n.a.	JQ646932
<i>Carabus (Carabus) arvensis</i> Herbst	OP756596	OP761227	OP757354	OP758374	OP758555	OP761663	OP761374	OP761526	OP745106
<i>Carabus (Carabus) granulatus</i> L.	n.a.	OP761230	n.a.	OP758377	OP758558	OP761666	OP761377	OP761529	n.a.
<i>Carabus (Carabus) granulatus</i> L.	OP756601	OP761233	n.a.	OP758380	OP758561	OP761669	OP761380	OP761532	OP745110
<i>Carabus (Carabus) menetriesi</i> Faldermann	OP756691	OP761318	OP757443	OP758472	OP758653	OP761759	OP761469	OP761615	OP745190
<i>Carabus (Carpathophilus) linnaei</i> Panzer	OP756715	OP761343	OP757469	OP758499	OP758680	OP761785	OP761496	OP761637	OP745216
<i>Carabus (Chaetocarabus) intricatus intricatus</i> L.	OP729898	OP761240	OP757366	OP758389	OP758570	OP761678	OP761388	OP761540	OP745118
<i>Carabus (Chaetocarabus) intricatus krueperi</i> Reitter	OP756698	OP761325	OP757450	OP758479	OP758660	OP761766	OP761476	OP761622	OP745197
<i>Carabus (Chrysocarabus) auronitens auronitens</i> Fabricius	OP756616	OP761247	OP757372	OP758396	OP758577	OP761684	OP761395	OP761547	OP745124
<i>Carabus (Chrysocarabus) auronitens festivus</i> Dejean	OP756676	OP761305	OP757431	OP758458	OP758639	OP761745	OP761456	OP761602	OP745181
<i>Carabus (Chrysocarabus) hispanus</i> Fabricius	OP756677	OP761306	OP757432	OP758459	OP758640	OP761746	OP761457	OP761603	OP745182
<i>Carabus (Cratocephalus) solskyi</i> Ballion	OP756639	OP761270	OP757395	OP758420	OP758601	OP761708	OP761419	OP761570	OP745147
<i>Carabus (Ctenocarabus) melancholicus</i> Fabricius	OP756641	OP761273	OP757398	OP758423	OP758604	OP761711	OP761422	OP761573	OP745149
<i>Carabus (Cupreocarabus) huangi</i> Deuve	JQ646535	n.a.	n.a.	JQ647330	n.a.	n.a.	JQ646737	JQ646837	JQ646902
<i>Carabus (Cytilocarabus) cribratus</i> Quensel	OP756701	OP761328	OP757453	OP758482	OP758663	OP761769	OP761479	OP761625	OP745200
<i>Carabus (Damaster) elysii pulcher</i> Kneifeld	OP756613	OP761244	OP757369	OP758393	OP758574	OP761681	OP761392	OP761544	OP745121
<i>Carabus (Damaster) formosus grumorum</i> Semenov	OP756680	OP761309	OP757435	OP758462	OP758643	OP761749	OP761460	OP761606	OP745184
<i>Carabus (Eurycarabus) famini</i> Dejean	JQ646543	n.a.	n.a.	JQ647320	n.a.	n.a.	n.a.	JQ646830	JQ646896
<i>Carabus (Eurycarabus) famini</i> Dejean	JQ646554	n.a.	n.a.	JQ647337	n.a.	n.a.	JQ646754	JQ646844	JQ646909
<i>Carabus (Eurycarabus) famini</i> Dejean	JQ689878	JQ689846	JQ689669	JQ689699	n.a.	n.a.	n.a.	n.a.	JQ689756
<i>Carabus (Eurycarabus) famini</i> Dejean	JQ689884	JQ689853	JQ689675	JQ689705	n.a.	n.a.	n.a.	n.a.	JQ689761
<i>Carabus (Eurycarabus) genei</i> Gené	JQ646619	AF231691	n.a.	JQ647336	n.a.	n.a.	n.a.	JQ646843	JQ646908
<i>Carabus (Hemicarabus) nitens</i> L.	OP756607	OP761237	OP757363	OP758386	OP758567	OP761675	OP761385	OP761537	OP745115

<i>Carabus (Hypsocarabus) laotse</i> Breuning	JQ646616	AB050750	n.a.	JQ647409	n.a.	n.a.	JQ646816	n.a.	n.a.
<i>Carabus (Hypsocarabus) mikhaili loustei</i> Deuve & Mourzine	JQ646537	n.a.	n.a.	JQ647315	n.a.	n.a.	JQ646739	n.a.	JQ646892
<i>Carabus (Imaibius) cavifrons</i> Mandl	OP756726	OP761354	OP757479	OP758510	OP758691	OP761796	OP761506	OP761646	OP745226
<i>Carabus (Imaibius) nouristani</i> Ledoux	OP756739	OP761367	OP757492	OP758523	OP758704	OP761809	OP761519	OP761656	OP745239
<i>Carabus (Imaibius) olafi</i> Deuve & Schmidt	OP756743	OP761371	OP757496	OP758527	OP758708	OP761813	OP761523	OP761660	OP745243
<i>Carabus (Isiocarabus) miaorum</i> Lassalle & Prunier	OP756603	OP761234	OP757360	OP758382	OP758563	OP761671	OP761382	OP761534	OP745112
<i>Carabus (Lamprostus) calleyi</i> Fischer	OP756703	OP761330	OP757455	OP758484	OP758665	OP761771	OP761481	OP761627	OP745202
<i>Carabus (Leptocarabus) seishinensis seunglaki</i> Kwon & Lee	JQ646580	n.a.	n.a.	JQ647371	n.a.	n.a.	JQ646783	JQ646869	n.a.
<i>Carabus (Leptocarabus) semiopacus</i> Reitter	JQ646578	AB031456	n.a.	JQ647369	n.a.	n.a.	JQ646781	AY183569	JQ646928
<i>Carabus (Leptocarabus) yokoae</i> Deuve	n.a.	AB031425	n.a.	JQ647326	n.a.	n.a.	n.a.	n.a.	n.a.
<i>Carabus (Limnocarabus) clatratus</i> L.	OP756597	OP761228	OP757355	OP758375	OP758556	OP761664	OP761375	OP761527	OP745107
<i>Carabus (Macrothorax) morbillosus</i> Fabricius	JQ646591	n.a.	n.a.	JQ647381	n.a.	n.a.	JQ646791	n.a.	JQ646936
<i>Carabus (Macrothorax) morbillosus</i> Fabricius	JQ689883	JQ689852	JQ689674	JQ689704	n.a.	n.a.	n.a.	n.a.	JQ689760
<i>Carabus (Macrothorax) morbillosus</i> Fabricius	JQ689896	JQ689866	JQ689687	JQ689716	n.a.	n.a.	n.a.	n.a.	JQ689772
<i>Carabus (Macrothorax) morbillosus</i> Fabricius	JQ689897	JQ689867	JQ689688	JQ689717	n.a.	n.a.	n.a.	n.a.	JQ689773
<i>Carabus (Macrothorax) morbillosus</i> Fabricius	JQ689898	JQ689868	JQ689689	JQ689718	n.a.	n.a.	n.a.	n.a.	JQ689774
<i>Carabus (Macrothorax) morbillosus</i> Fabricius	JX279622	JX279703	JX279661	JX279676	n.a.	n.a.	n.a.	n.a.	JX279650
<i>Carabus (Macrothorax) rugosus</i> Fabricius	JQ689882	JQ689851	JQ689673	JQ689703	n.a.	n.a.	n.a.	n.a.	JQ689759
<i>Carabus (Macrothorax) rugosus</i> Fabricius	JQ689892	JQ689861	JQ689683	JQ689712	n.a.	n.a.	n.a.	n.a.	JQ689768
<i>Carabus (Meganebrius) alanstivelli</i> Morvan	OP756685	OP761312	OP757437	OP758466	OP758647	OP761753	OP761463	OP761609	OP745185
<i>Carabus (Meganebrius) arunensis</i> Heinert	OP756653	OP761282	OP757408	OP758435	OP758616	OP761723	OP761433	n.a.	OP745159
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	OP756628	OP761259	OP757384	OP758408	OP758589	OP761696	OP761407	OP761559	OP745136
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	OP756719	OP761347	OP757472	OP758503	OP758684	OP761789	OP761499	OP761641	OP745219
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	OP756731	OP761359	OP757484	OP758515	OP758696	OP761801	OP761511	OP761651	OP745231
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	OP756732	OP761360	OP757485	OP758516	OP758697	OP761802	OP761512	OP761652	OP745232
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	OP756735	OP761363	OP757488	OP758519	OP758700	OP761805	OP761515	OP761655	OP745235
<i>Carabus (Meganebrius) deliae morvani</i> Lassalle	OP756627	OP761258	OP757383	OP758407	OP758588	OP761695	OP761406	OP761558	OP745135
<i>Carabus (Meganebrius) deliae morvani</i> Lassalle	OP756706	OP761334	OP757459	OP758488	OP758669	OP761775	OP761485	OP761631	OP745206
<i>Carabus (Meganebrius) epsteini annapurnae</i> Deuve & Schmidt	OP756729	OP761357	OP757482	OP758513	OP758694	OP761799	OP761509	OP761649	OP745229
<i>Carabus (Meganebrius) epsteini epsteini</i> Heinert	OP756626	OP761257	OP757382	OP758406	OP758587	OP761694	OP761405	OP761557	OP745134
<i>Carabus (Meganebrius) epsteini epsteini</i> Heinert	OP756633	OP761264	OP757389	OP758413	OP758594	OP761701	OP761412	OP761564	OP745141
<i>Carabus (Meganebrius) epsteini yetiphilus</i> Deuve & Schmidt	OP756730	OP761358	OP757483	OP758514	OP758695	OP761800	OP761510	OP761650	OP745230
<i>Carabus (Meganebrius) everesti everesti</i> Andrewes	OP756740	OP761368	OP757493	OP758524	OP758705	OP761810	OP761520	OP761657	OP745240
<i>Carabus (Meganebrius) everesti everesti</i> Andrewes	OP756708	OP761336	OP757461	OP758490	OP758671	OP761777	OP761487	OP761633	OP745208

<i>Carabus (Meganebrius) everesti everesti</i> Andrewes	OP756712	OP761340	OP757465	OP758494	OP758675	OP761781	OP761491	OP761636	OP745212
<i>Carabus (Meganebrius) everesti kleinfeldi</i> Korell	OP756659	OP761288	OP757414	OP758441	OP758622	n.a.	OP761439	OP761587	OP745165
<i>Carabus (Meganebrius) franzi</i> Mandl	OP756658	OP761287	OP757413	OP758440	OP758621	OP761728	OP761438	OP761586	OP745164
<i>Carabus (Meganebrius) granulatocostatus</i> Mandl	OP756665	OP761294	OP757420	OP758447	OP758628	OP761734	OP761445	OP761593	OP745171
<i>Carabus (Meganebrius) indicus</i> Fairmaire	OP756655	OP761284	OP757410	OP758437	OP758618	OP761725	OP761435	n.a.	OP745161
<i>Carabus (Meganebrius) kadoudali</i> Morvan	OP756660	OP761289	OP757415	OP758442	OP758623	OP761729	OP761440	OP761588	OP745166
<i>Carabus (Meganebrius) kadoudali</i> Morvan	OP756707	OP761335	OP757460	OP758489	OP758670	OP761776	OP761486	OP761632	OP745207
<i>Carabus (Meganebrius) koganae</i> Colas	OP756662	OP761291	OP757417	OP758444	OP758625	OP761731	OP761442	OP761590	OP745168
<i>Carabus (Meganebrius) lebrethae densestriolatus</i> Mandl	OP756687	OP761314	OP757439	OP758468	OP758649	OP761755	OP761465	OP761611	OP745187
<i>Carabus (Meganebrius) lebrethae lebrethae</i> Colas	OP756663	OP761292	OP757418	OP758445	OP758626	OP761732	OP761443	OP761591	OP745169
<i>Carabus (Meganebrius) lebrethae lebrethae</i> Colas	OP756664	OP761293	OP757419	OP758446	OP758627	OP761733	OP761444	OP761592	OP745170
<i>Carabus (Meganebrius) lebrethae lebrethae</i> Colas	OP756711	OP761339	OP757464	OP758493	OP758674	OP761780	OP761490	OP761635	OP745211
<i>Carabus (Meganebrius) montreuili</i> Deuve	OP756654	OP761283	OP757409	OP758436	OP758617	OP761724	OP761434	OP761583	OP745160
<i>Carabus (Meganebrius) montreuili</i> Deuve	OP756661	OP761290	OP757416	OP758443	OP758624	OP761730	OP761441	OP761589	OP745167
<i>Carabus (Meganebrius) montreuili</i> Deuve	OP756686	OP761313	OP757438	OP758467	OP758648	OP761754	OP761464	OP761610	OP745186
<i>Carabus (Meganebrius) pseudohamandi</i> Mandl	OP756667	OP761296	OP757422	OP758449	OP758630	OP761736	OP761447	n.a.	n.a.
<i>Carabus (Meganebrius) queinneci</i> Deuve	OP756650	OP761280	OP757405	OP758432	OP758613	OP761720	OP761430	OP761580	OP745156
<i>Carabus (Meganebrius) quinlani brittoni</i> Mandl	OP756640	OP761271	OP757396	OP758421	OP758602	OP761709	OP761420	OP761571	OP745148
<i>Carabus (Meganebrius) quinlani brittoni</i> Mandl	OP756720	OP761348	OP757473	OP758504	OP758685	OP761790	OP761500	OP761642	OP745220
<i>Carabus (Meganebrius) quinlani brittoni</i> Mandl	OP756721	OP761349	OP757474	OP758505	OP758686	OP761791	OP761501	OP761643	OP745221
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	OP756625	OP761256	OP757381	OP758405	OP758586	OP761693	OP761404	OP761556	OP745133
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	OP756736	OP761364	OP757489	OP758520	OP758701	OP761806	OP761516	n.a.	OP745236
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	OP756737	OP761365	OP757490	OP758521	OP758702	OP761807	OP761517	n.a.	OP745237
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	OP756693	OP761320	OP757445	OP758474	OP758655	OP761761	OP761471	OP761617	OP745192
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	OP756700	OP761327	OP757452	OP758481	OP758662	OP761768	OP761478	OP761624	OP745199
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	OP756733	OP761361	OP757486	OP758517	OP758698	OP761803	OP761513	OP761653	OP745233
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	OP756734	OP761362	OP757487	OP758518	OP758699	OP761804	OP761514	OP761654	OP745234
<i>Carabus (Meganebrius) quinlani smetanai</i> Häckel & Brezina	OP756618	OP761249	OP757374	OP758398	OP758579	OP761686	OP761397	OP761549	OP745126
<i>Carabus (Meganebrius) quinlani smetanai</i> Häckel & Brezina	n.a.	OP761333	OP757458	OP758487	OP758668	OP761774	OP761484	OP761630	OP745205
<i>Carabus (Meganebrius) salpansis</i> Deuve	OP756738	OP761366	OP757491	OP758522	OP758703	OP761808	OP761518	n.a.	OP745238
<i>Carabus (Meganebrius) salpansis</i> Deuve	OP756666	OP761295	OP757421	OP758448	OP758629	OP761735	OP761446	n.a.	OP745172
<i>Carabus (Meganebrius) santostamangi santostamangi</i> Deuve & Schmidt	n.a.	n.a.	OP757466	OP758495	OP758676	OP761782	OP761492	n.a.	OP745213
<i>Carabus (Meganebrius) santostamangi santostamangi</i> Deuve & Schmidt	OP729899	OP761341	OP757467	OP758496	OP758677	OP761783	OP761493	n.a.	OP745214
<i>Carabus (Meganebrius) santostamangi thanglaensis</i> Deuve & Schmidt	OP756714	n.a.	n.a.	OP758498	OP758679	n.a.	OP761495	n.a.	n.a.

<i>Carabus (Meganebrius) scheibei</i> Eidam	OP756681	OP761310	n.a.	n.a.	n.a.	n.a.	OP761461	OP761607	n.a.
<i>Carabus (Meganebrius) sp.n. near granulaticostatus</i>	OP756741	OP761369	OP757494	OP758525	OP758706	OP761811	OP761521	OP761658	OP745241
<i>Carabus (Meganebrius) tamang gurkhaorum</i> Lassalle	n.a.	OP761272	OP757397	OP758422	OP758603	OP761710	OP761421	OP761572	n.a.
<i>Carabus (Meganebrius) tamang probsti</i> Deuve	OP756727	OP761355	OP757480	OP758511	OP758692	OP761797	OP761507	OP761647	OP745227
<i>Carabus (Meganebrius) tamang tamang</i> Deuve	OP756643	OP761275	OP757400	OP758425	OP758606	OP761713	OP761424	OP761575	OP745151
<i>Carabus (Meganebrius) thudamensis</i> Deuve & Schmidt	OP756713	OP761342	OP757468	OP758497	OP758678	OP761784	OP761494	n.a.	OP745215
<i>Carabus (Meganebrius) tuberculipennis ganjalaensis</i> Deuve	OP756710	OP761338	OP757463	OP758492	OP758673	OP761779	OP761489	OP761634	OP745210
<i>Carabus (Meganebrius) tuberculipennis ssp.n.</i>	OP756656	OP761285	OP757411	OP758438	OP758619	OP761726	OP761436	OP761584	OP745162
<i>Carabus (Meganebrius) tuberculipennis tuberculipennis</i> Mandl	OP756705	OP761332	OP757457	OP758486	OP758667	OP761773	OP761483	OP761629	OP745204
<i>Carabus (Meganebrius) wallichi</i> Hope	OP756657	OP761286	OP757412	OP758439	OP758620	OP761727	OP761437	OP761585	OP745163
<i>Carabus (Megodontus) germarii</i> Sturm	OP756717	OP761345	OP757471	OP758501	OP758682	OP761787	OP761497	OP761639	OP745217
<i>Carabus (Megodontus) violaceus dryas</i> Gistel	OP756699	OP761326	OP757451	OP758480	OP758661	OP761767	OP761477	OP761623	OP745198
<i>Carabus (Megodontus) violaceus purpurascens</i> Fabricius	OP756678	OP761307	OP757433	OP758460	OP758641	OP761747	OP761458	OP761604	OP745183
<i>Carabus (Megodontus) violaceus purpurascens</i> Fabricius	OP756690	OP761317	OP757442	OP758471	OP758652	OP761758	OP761468	OP761614	OP745189
<i>Carabus (Megodontus) violaceus violaceus</i> L.	OP756605	OP761236	OP757362	OP758384	OP758565	OP761673	OP761384	OP761536	OP745114
<i>Carabus (Mesocarabus) dufourii</i> Dejean	JQ689936	JQ689873	JQ689694	JQ689722	n.a.	n.a.	n.a.	n.a.	JQ689778
<i>Carabus (Mesocarabus) dufourii</i> Dejean	JX278213	n.a.	JX278889	JX279131	n.a.	n.a.	n.a.	n.a.	JX278660
<i>Carabus (Mesocarabus) lusitanicus lusitanicus</i> Fabricius	OP756642	OP761274	OP757399	OP758424	OP758605	OP761712	OP761423	OP761574	OP745150
<i>Carabus (Mesocarabus) macrocephalus</i> Dejean	JQ689879	JQ689847	JQ689670	JQ689700	n.a.	n.a.	n.a.	n.a.	JQ689757
<i>Carabus (Mesocarabus) problematicus andorranus</i> Lapouge	OP756672	OP761301	OP757427	OP758454	OP758635	OP761741	OP761452	OP761598	OP745177
<i>Carabus (Mesocarabus) problematicus problematicus</i> Herbst	OP756615	OP761246	OP757371	OP758395	OP758576	OP761683	OP761394	OP761546	OP745123
<i>Carabus (Mesocarabus) problematicus problematicus</i> Herbst	OP756675	OP761304	OP757430	OP758457	OP758638	OP761744	OP761455	OP761601	OP745180
<i>Carabus (Mesocarabus) riffensis</i> Fairmaire	JQ689881	JQ689850	JQ689672	JQ689702	n.a.	n.a.	n.a.	n.a.	JQ689758
<i>Carabus (Mesocarabus) riffensis</i> Fairmaire	JX278137	JX279488	JX278812	JX279055	HG813129	n.a.	n.a.	n.a.	JX278600
<i>Carabus (Mimocarabus) maurus</i> (Adams)	OP756702	OP761329	OP757454	OP758483	OP758664	OP761770	OP761480	OP761626	OP745201
<i>Carabus (Neoplesius) borodini</i> Heinz	OP756624	OP761255	OP757380	OP758404	OP758585	OP761692	OP761403	OP761555	OP745132
<i>Carabus (Neoplesius) danae</i> Kaláb	OP756611	OP761242	OP757368	OP758391	OP758572	OP761680	OP761390	OP761542	OP745120
<i>Carabus (Neoplesius) nanschanicus nocticolor</i> Deuve & Kaláb	JQ646540	n.a.	n.a.	JQ647318	n.a.	n.a.	JQ646741	JQ646828	JQ646894
<i>Carabus (Neoplesius) paulusi kocmani</i> Kaláb	OP756623	OP761254	OP757379	OP758403	OP758584	OP761691	OP761402	OP761554	OP745131
<i>Carabus (Neoplesius) paulusi paulusi</i> Kaláb	OP756724	OP761352	OP757477	OP758508	OP758689	OP761794	OP761504	OP761645	OP745224
<i>Carabus (Neoplesius) wagae folwarznyi</i> Deuve	OP756722	OP761350	OP757475	OP758506	OP758687	OP761792	OP761502	OP761644	OP745222
<i>Carabus (Neoplesius) wagae glasnowi</i> Heinz	OP756612	OP761243	n.a.	OP758392	OP758573	n.a.	OP761391	OP761543	n.a.
<i>Carabus (Neoplesius) wagae glinkai</i> Heinz	OP756610	OP761241	OP757367	OP758390	OP758571	OP761679	OP761389	OP761541	OP745119
<i>Carabus (Neoplesius) wagae mustangensis</i> Deuve	OP756635	OP761265	OP757390	OP758415	OP758596	OP761703	OP761414	OP761565	OP745142

<i>Carabus (Neoplesius) wagaе nyalamensis</i> Deuve	OP756622	OP761253	OP757378	OP758402	OP758583	OP761690	OP761401	OP761553	OP745130
<i>Carabus (Neoplesius) wagaе tanguticus</i> Semenov	OP756629	OP761260	OP757385	OP758409	OP758590	OP761697	OP761408	OP761560	OP745137
<i>Carabus (Neoplesius) wagaе wagaе</i> Fairmaire	OP756728	OP761356	OP757481	OP758512	OP758693	OP761798	OP761508	OP761648	OP745228
<i>Carabus (Nesaeocarabus) abbreviatus</i> Brullé	OP756688	OP761315	OP757440	OP758469	OP758650	OP761756	OP761466	OP761612	n.a.
<i>Carabus (Ophiocarabus) latiballioni</i> Deuve	OP756637	OP761268	OP757393	OP758418	OP758599	OP761706	OP761417	OP761568	OP745145
<i>Carabus (Ophiocarabus) praecox</i> Semenov	OP756638	OP761269	OP757394	OP758419	OP758600	OP761707	OP761418	OP761569	OP745146
<i>Carabus (Ophiocarabus) tekesensis</i> Deuve & Tian	n.a.	OP761266	OP757391	OP758416	OP758597	OP761704	OP761415	OP761566	OP745143
<i>Carabus (Ophiocarabus) tekesensis</i> Deuve & Tian	OP756636	OP761267	OP757392	OP758417	OP758598	OP761705	OP761416	OP761567	OP745144
<i>Carabus (Orinocarabus) alpestris dolomitanus</i> Mandl	OP756694	OP761321	OP757446	OP758475	OP758656	OP761762	OP761472	OP761618	OP745193
<i>Carabus (Orinocarabus) alpestris dolomitanus</i> Mandl	OP756695	OP761322	OP757447	OP758476	OP758657	OP761763	OP761473	OP761619	OP745194
<i>Carabus (Orinocarabus) baudii</i> Kraatz	OP756673	OP761302	OP757428	OP758455	OP758636	OP761742	OP761453	OP761599	OP745178
<i>Carabus (Orinocarabus) concolor</i> Fabricius	OP756674	OP761303	OP757429	OP758456	OP758637	OP761743	OP761454	OP761600	OP745179
<i>Carabus (Orinocarabus) heteromorphus</i> Daniel	OP756670	OP761299	OP757425	OP758452	OP758633	OP761739	OP761450	OP761596	OP745175
<i>Carabus (Orinocarabus) sylvestris</i> Panzer	OP756617	OP761248	OP757373	OP758397	OP758578	OP761685	OP761396	OP761548	OP745125
<i>Carabus (Pachystus) glabratus</i> Paykull	OP756594	OP761225	OP757352	OP758372	OP758553	OP761661	OP761372	OP761524	OP745105
<i>Carabus (Pachystus) hortensis</i> L.	OP756595	OP761226	OP757353	OP758373	OP758554	OP761662	OP761373	OP761525	n.a.
<i>Carabus (Pachystus) hortensis</i> L.	OP756600	OP761232	OP757358	OP758379	OP758560	OP761668	OP761379	OP761531	n.a.
<i>Carabus (Pachystus) preslii neumeyeri</i> Schaum	OP756679	OP761308	OP757434	OP758461	OP758642	OP761748	OP761459	OP761605	n.a.
<i>Carabus (Pagocarabus) crassesculptus</i> Kraatz	OP756619	OP761250	OP757375	OP758399	OP758580	OP761687	OP761398	OP761550	OP745127
<i>Carabus (Pagocarabus) crassesculptus</i> Kraatz	OP756630	OP761261	OP757386	OP758410	OP758591	OP761698	OP761409	OP761561	OP745138
<i>Carabus (Pagocarabus) crassesculptus</i> Kraatz	OP756646	OP761277	OP757402	OP758428	OP758609	OP761716	OP761426	OP761577	OP745153
<i>Carabus (Piocarabus) reitterianus</i> Breuning	JQ646533	AB092733	n.a.	JQ647311	n.a.	n.a.	JQ646735	n.a.	n.a.
<i>Carabus (Piocarabus) titanus</i> Breuning	JQ646532	AB092726	n.a.	JQ647310	n.a.	n.a.	JQ646734	JQ646823	n.a.
<i>Carabus (Platycarabus) creutzeri</i> Fabricius	OP756696	OP761323	OP757448	OP758477	OP758658	OP761764	OP761474	OP761620	OP745195
<i>Carabus (Platycarabus) creutzeri</i> Fabricius	OP756697	OP761324	OP757449	OP758478	OP758659	OP761765	OP761475	OP761621	OP745196
<i>Carabus (Platycarabus) creutzeri</i> Fabricius	OP756716	OP761344	OP757470	OP758500	OP758681	OP761786	n.a.	OP761638	n.a.
<i>Carabus (Platycarabus) creutzeri</i> Fabricius	OP756718	OP761346	n.a.	OP758502	OP758683	OP761788	OP761498	OP761640	OP745218
<i>Carabus (Platycarabus) depressus</i> Bonelli	OP756669	OP761298	OP757424	OP758451	OP758632	OP761738	OP761449	OP761595	OP745174
<i>Carabus (Platycarabus) irregularis</i> Fabricius	OP756668	OP761297	OP757423	OP758450	OP758631	OP761737	OP761448	OP761594	OP745173
<i>Carabus (Procrustes) coriaceus</i> L.	OP756609	OP761239	OP757365	OP758388	OP758569	OP761677	OP761387	OP761539	OP745117
<i>Carabus (Procrustes) coriaceus</i> L.	OP756692	OP761319	OP757444	OP758473	OP758654	OP761760	OP761470	OP761616	OP745191
<i>Carabus (Pseudocranion) gansuensis</i> Semenov	JQ646587	AB101183	n.a.	JQ647377	HG813126	n.a.	AY183614	AY183535	JQ646933
<i>Carabus (Pseudocranion) sackeni remondianus</i> Deuve	OP756644	OP761276	OP757401	OP758426	OP758607	OP761714	n.a.	OP761576	OP745152
<i>Carabus (Pseudocranion) tibetanophilus yak</i> Deuve	JQ646534	n.a.	n.a.	JQ647312	n.a.	n.a.	JQ646736	JQ646824	JQ646890

<i>Carabus (Rhigocarabus) buddaicus gansuicus</i> Deuve	JQ646550	AB092755	n.a.	JQ647329	n.a.	n.a.	JQ646749	JQ646836	n.a.
<i>Carabus (Rhigocarabus) cateniger</i> Morawitz	OP756621	OP761252	OP757377	OP758401	OP758582	OP761689	OP761400	OP761552	OP745129
<i>Carabus (Rhigocarabus) gracilicollis shatanensis</i> Deuve & Tian	JQ646536	n.a.	n.a.	JQ647314	n.a.	n.a.	JQ646738	JQ646825	n.a.
<i>Carabus (Rhigocarabus) ladygini</i> Semenov	OP756620	OP761251	OP757376	OP758400	OP758581	OP761688	OP761399	OP761551	OP745128
<i>Carabus (Rhigocarabus) ladygini</i> Semenov	OP756648	OP761278	OP757403	OP758430	OP758611	OP761718	OP761428	OP761578	OP745154
<i>Carabus (Rhigocarabus) ladygini</i> Semenov	OP756649	OP761279	OP757404	OP758431	OP758612	OP761719	OP761429	OP761579	OP745155
<i>Carabus (Rhigocarabus) morawitzianus</i> Semenov	OP756723	OP761351	OP757476	OP758507	OP758688	OP761793	OP761503	n.a.	OP745223
<i>Carabus (Rhigocarabus) morawitzianus</i> Semenov	OP756725	OP761353	OP757478	OP758509	OP758690	OP761795	OP761505	n.a.	OP745225
<i>Carabus (Rhigocarabus) roborowskii</i> Semenov	OP756631	OP761262	OP757387	OP758411	OP758592	OP761699	OP761410	OP761562	OP745139
<i>Carabus (Rhigocarabus) roborowskii</i> Semenov	OP756632	OP761263	OP757388	OP758412	OP758593	OP761700	OP761411	OP761563	OP745140
<i>Carabus (Rhigocarabus) xiei abaxianensis</i> Deuve & Tian	JQ646539	n.a.	n.a.	JQ647317	n.a.	n.a.	JQ646740	JQ646827	n.a.
<i>Carabus (Sphodristocarabus) armeniacus</i> Mannerheim	OP756704	OP761331	OP757456	OP758485	OP758666	OP761772	OP761482	OP761628	OP745203
<i>Carabus (Tachypus) auratus</i> L.	OP756598	OP761229	OP757356	OP758376	OP758557	OP761665	OP761376	OP761528	OP745108
<i>Carabus (Tomocarabus) convexus convexus</i> Fabricius	OP756599	OP761231	OP757357	OP758378	OP758559	OP761667	OP761378	OP761530	OP745109
<i>Carabus (Tomocarabus) convexus convexus</i> Fabricius	OP756671	OP761300	OP757426	OP758453	OP758634	OP761740	OP761451	OP761597	OP745176
<i>Carabus (Tomocarabus) convexus hornschi</i> Hoppe	OP756709	OP761337	OP757462	OP758491	OP758672	OP761778	OP761488	n.a.	OP745209
<i>Carabus (Tomocarabus) fraterculus jirisanensis</i> Ishikawa & Kim	JQ646577	n.a.	n.a.	JQ647368	n.a.	n.a.	JQ646780	n.a.	n.a.
<i>Carabus (Tomocarabus) rumelicus syriensis</i> Breuning	n.a.	n.a.	n.a.	JQ647339	n.a.	n.a.	JQ646756	JQ646846	n.a.
<i>Carabus (Ulocarabus) theanus</i> Reitter	OP756742	OP761370	OP757495	OP758526	OP758707	OP761812	OP761522	OP761659	OP745242
<i>Cychrus (Cychropsis) mandli</i> (Paulus)	OP756634	n.a.	n.a.	OP758414	OP758595	OP761702	OP761413	n.a.	n.a.
<i>Cychrus (Cychrus) attenuatus</i> (Fabricius)	OP756683	n.a.	n.a.	OP758464	OP758645	OP761751	n.a.	n.a.	n.a.
<i>Cychrus (Cychrus) caraboides</i> (L.)	OP756606	n.a.	n.a.	OP758385	OP758566	OP761674	n.a.	n.a.	n.a.
<i>Cychrus (Cychrus) kaznakovi tongrenicus</i> Deuve	OP756647	n.a.	n.a.	OP758429	OP758610	OP761717	OP761427	n.a.	n.a.
<i>Cychrus (Cychrus) starcki</i> Reitter	OP756645	n.a.	n.a.	OP758427	OP758608	OP761715	OP761425	n.a.	n.a.
<i>Cychrus (Cychrus) stoetznerei</i> Roeschke	OP756684	n.a.	n.a.	OP758465	OP758646	OP761752	OP761462	n.a.	n.a.

Table S4. List of primers used in this study.

Gene	Primer	Direction	Sequence (5'-3')	Reference
COI	LCO1490	forward	GGT CAA CAA ATC ATA AAG ATA TTG G	[1]
	wagCOI _{fw}	forward	CTA GTA TTG CCC ATA GAG GGG CAT C	this study
	JER	forward	CAA CAT TTA TTT TGA TTT TTT GG	[2]
	COI 981F	forward	GGA TTA ACA GGA GTA GTA TTA GCT	this study
	QuinRev	reverse	TGT TGT AAT AAA RTT TAC AGC YCC	this study
	CarabusMT	reverse	YCC YAA AGA ACC AAA GGT TTC CT	this study
	COI 1085R	reverse	TAC TGC TCC TAT TGA TAA AAC A	this study
	PATnew	reverse	TCT AAT ATG GCA GAW TAG TGC AHT	[3]
ND5	V1.61	forward	CCT GTT TCT GCT TTA GTT CA	[4]
	V1.04	reverse	GTC ATA CTC TAA ATA TAA GCT A	[4]
	ND5-569R	reverse	CCC TCA TCA TTT AAA GAA TG	this study
	ND5-421F	forward	GTA GTT TCT ATA GAT TTT GT	this study
28S	D1	forward	GGG AGG AAA AGA AAC TAA C	[5]
	D3i	reverse	GCA TAG TTC ACC ATC TTT C	[6]
	28S-655R	reverse	CAA CAC CAC AAG TCA TAC	this study
	28S-477F	forward	GTT GAG TTG TTG TTC AGT	this study
18S	18S _{fw}	forward	CCT AYC TGG TTG ATC CTG CCA GT	[7]
	18S _{rev}	reverse	TAA TGA TCC TTC CGC AGG TT	[7]
	18S-397F	forward	TAC CAC ATC CAA GGA AGG CAG	this study
	18S-977F	forward	TTC GAA GGC GAT CAG ATA CCG	this study
	18S-1548F	forward	GGC GTA CAA TTG AAT CTT CTT	this study
	18S-577R	reverse	TGG AAT TAC CGC GGC TGC TG	this study
	18S-1220R	reverse	GCC CTT CCG TCA ATT CCT TT	this study
	18S-1678R	reverse	GAG GAC ACG CTG ATT CCT TCA	this study
ITS2	ITS3	forward	GCA TCG ATG AAG AAC GCA GC	[8]
	ITS28	reverse	CGC CGT TAC TAG GGG AAT CCT TGT AAG	[9]
CAD	CD806F	forward	GTN GTN AAR ATG CCN MGN TGG GA	[10]
	CD1231R	reverse	TCC ACG TGT TCN GAN ACN GCC ATR CA	[11]
	CD1098R	reverse	GCT ATG TTG TTN GGN AGY TGD CCN CCC AT	[10]
wingless	CARWL1	forward	ATG TCT GGC ACC TGC ACC GT	[12]
	CARWL2	reverse	CAA GCG CAC CGT TCC ACA ACG A	[12]
PEPCK	CARPEK1	forward	GCC ATG ATG ACA CCA ACA CT	[13]
	CARPEK3	reverse	GAC GTG GAA GAT CTT GGG CA	[13]
HUWE1	gwenck1	forward	GTG ACG AAC AAG AAG ATA TGG	[14]
	carck2	reverse	GTG GTT CGC ATC TCA ACA GA	[13]

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Table S5. PCR conditions applied in this study.

Primer fw	Primer rev	PCR conditions	No. of cycles
LCO1490	PATnew	94°C/5 min; 94°C/1 min; 52.5°C/1 min; 72°C/1.5 min; 72°C/10 min	38
LCO1490	CarabusMT	94°C/5 min; 94°C/1 min; 52.5°C/1 min; 72°C/1.5 min; 72°C/10 min	38
JER	PATnew	94°C/5 min; 94°C/1 min; 53°C/1 min; 72°C/1 min; 72°C/10 min	38
LCO1490	QuinRev	94°C/5 min; 94°C/1 min; 46°C/1 min; 72°C/1.5 min; 72°C/10 min	38
wagCOI fw	CarabusMT	94°C/5 min; 94°C/1 min; 54°C/1 min; 72°C/1.5 min; 72°C/10 min	38
JER	COI 1085R	94°C/5 min; 94°C/0.5 min; 47.5°C/0.5 min; 72°C/2 min; 72°C/7 min	36
COI 981F	PATnew	94°C/5 min; 94°C/0.5 min; 49°C/ 0.5 min; 72°C/2 min; 72°C/7 min	36
V1.61	V1.04	94°C/5 min; 94°C/1 min; 50°C/2 min; 72°C/2 min; 72°C/7 min	35
V1.61	ND5-569R	94°C/5 min; 94°C/0.5 min; 45°C/0.5 min; 72°C/2 min; 72°C/7 min	35
ND5-421F	V1.04	94°C/5 min; 94°C/0.5 min; 42°C/0.5 min; 72°C/2 min; 72°C/7 min	35
D1	D3i	94°C/5 min; 94°C/20 sec; 53°C/20 sec; 72°C/50 sec; 72°C/7 min	36
D1	28S-655R	94°C/5 min; 94°C/0.5 min; 47°C/0.5 min; 72°C/2 min; 72°C/7 min	36
28S-477F	D3i	94°C/5 min; 94°C/0.5 min; 47°C/0.5 min; 72°C/2 min; 72°C/7 min	36
18Sfw	18Srev	94°C/3 min; 94°C/0.5 min; 54°C/0.5 min; 72°C/1.5 min; 72°C/10 min	35
18Sfw	18S-1220R	94°C/5 min; 94°C/0.5 min; 53°C/0.5 min; 72°C/1.5 min; 72°C/10 min	35
18S-977F	18Srev	94°C/5 min; 94°C/0.5 min; 53°C/0.5 min; 72°C/1.5 min; 72°C/10 min	35
18Sfw	18S-577R	94°C/3 min; 94°C/0.5 min; 55°C/0.5 min; 72°C/2 min; 72°C/7 min	35
18S-397F	18S-1220R	94°C/3 min; 94°C/1 min; 55°C/1 min; 72°C/1 min; 72°C/10 min	35
18S-977F	18S-1678R	94°C/3 min; 94°C/0.5 min; 55°C/0.5 min; 72°C/2 min; 72°C/7 min	35
18S-1548F	18Srev	94°C/3 min; 94°C/0.5 min; 48°C/0.5 min; 72°C/2 min; 72°C/7 min	36
ITS3	ITS28	94°C/5 min; 94°C/1 min; 48°C/1 min; 72°C/1 min; 72°C/5 min	31
CD806F	CD1231R	94°C/3 min; 94°C/0.5 min; 60/55°C/0.5 min; 72°C/2 min; 72°C/4 min	9/30
CD806F	CD1098R	94°C/3 min; 94°C/0.5 min; 55°C/0.5 min; 72°C/1.5 min; 72°C/10 min	37
CARWL1	CARWL2	94°C/3 min; 94°C/45 sec; 58°C/45 sec; 72°C/1 min; 72°C/10 min	35
CARPEK1	CARPEK3	94°C/3 min; 94°C/0.5 min; 55°C/1 min; 72°C/1 min; 72°C/10 min	38
gwenck1	carck2	94°C/3 min; 94°C/0.5 min; 60°C/0.5 min; 72°C/1 min; 72°C/10 min	35

Table S6: List of *Carabus* and outgroup species used for the ancestral habitat reconstruction with information on the species specifically preferred temperature resp. elevational zones.

	Temp. resp. elevational zone(s)	Data source
<i>Calosoma (Calosoma) inquisitor</i> (L.)	C	[1]
<i>Calosoma (Campalita) maderae auropunctatum</i> (Herbst)	ABCD	[1]
<i>Calosoma (Carabomorphus) gestroi</i> Breuning	DE	[1]
<i>Calosoma (Carabops) abyssinicum</i> Gestro	C	[1]
<i>Carabus (Acoptolabus) gehinii</i> Fairmaire	C	[2–4]
<i>Carabus (Apotomopterus) sauteri yunkaicus</i> Deuve	BC	[2–4]
<i>Carabus (Apotomopterus) torquatus torquatus</i> Cavazzuti	C	[2–4]
<i>Carabus (Archicarabus) nemoralis</i> Müller	C	[5]
<i>Carabus (Aulonocarabus) canaliculatus careniger</i> Chaudoir	CD	[2–4]
<i>Carabus (Calocarabus) przewalskii elnarae</i> Cavazzuti	DE	[2–4]
<i>Carabus (Carabus) arvensis</i> Herbst	CD	[5]
<i>Carabus (Carabus) granulatus</i> L.	BCD	[5]
<i>Carabus (Carabus) menetriesi</i> Faldermann	CD	[5]
<i>Carabus (Carpathophilus) linnaei</i> Panzer	CD	[5]
<i>Carabus (Chaetocarabus) intricatus intricatus</i> L.	BC	[5]
<i>Carabus (Chaetocarabus) intricatus krueperi</i> Reitter	BC	[5]
<i>Carabus (Chrysocarabus) auronitens auronitens</i> Fabricius	CD	[5]
<i>Carabus (Chrysocarabus) auronitens festivus</i> Dejean	CD	[5]
<i>Carabus (Chrysocarabus) hispanus</i> Fabricius	CD	[2, 5]
<i>Carabus (Cratocephalus) solskyi</i> Ballion	CD	[2, 6]
<i>Carabus (Ctenocarabus) melancholicus</i> Fabricius	C	[5]
<i>Carabus (Cupreocarabus) huangi</i> Deuve	DE	[2–4]
<i>Carabus (Cytilocarabus) cribratus</i> Quensel	CDE	[2, 7, 8]
<i>Carabus (Damaster) elysii pulcher</i> Kleinfeld	BC	[2–4]
<i>Carabus (Damaster) formosus grumorum</i> Semenov	BC	[2–4]
<i>Carabus (Eurycarabus) famini</i> Dejean	BC	[5]
<i>Carabus (Eurycarabus) genei</i> Gené	BC	[5]
<i>Carabus (Hemicarabus) nitens</i> L.	CD	[5]
<i>Carabus (Hypsocarabus) laotse</i> Breuning	DE	[2–4]
<i>Carabus (Hypsocarabus) mikhaili loustei</i> Deuve & Mourzine	CD	[2–4]
<i>Carabus (Imaibius) cavifrons</i> Mandl	CD	[7]
<i>Carabus (Imaibius) nouristani</i> Ledoux	CD	[2]
<i>Carabus (Imaibius) olafi</i> Deuve & Schmidt	B	[7]
<i>Carabus (Isiocarabus) miaorum</i> Lassalle & Prunier	BC	[2–4]
<i>Carabus (Lamprostus) calleyi</i> Fischer	BC	[2, 7, 9]
<i>Carabus (Leptocarabus) seishinensis seunglaki</i> Kwon & Lee	C	[2–4]
<i>Carabus (Leptocarabus) semiopacus</i> Reitter	C	[2]
<i>Carabus (Leptocarabus) yokoae</i> Deuve	CD	[2–4]
<i>Carabus (Limnocarabus) clatratus</i> L.	BC	[5]
<i>Carabus (Macrothorax) morbillosus</i> Fabricius	B	[5]
<i>Carabus (Macrothorax) rugosus</i> Fabricius	B	[5]
<i>Carabus (Meganebrius) alanstivelli</i> Morvan	DE	own unpubl. data
<i>Carabus (Meganebrius) arunensis</i> Heinert	B	own unpubl. data
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	CDE	own unpubl. data
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	CDE	own unpubl. data
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	CDE	own unpubl. data
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	CDE	own unpubl. data
<i>Carabus (Meganebrius) deliae deliae</i> Morvan	CDE	own unpubl. data
<i>Carabus (Meganebrius) deliae morvani</i> Lassalle	CD	own unpubl. data
<i>Carabus (Meganebrius) deliae morvani</i> Lassalle	CD	own unpubl. data
<i>Carabus (Meganebrius) epsteini annapurnae</i> Deuve & Schmidt	EF	own unpubl. data
<i>Carabus (Meganebrius) epsteini epsteini</i> Heinert	EF	own unpubl. data
<i>Carabus (Meganebrius) epsteini yetiphilus</i> Deuve & Schmidt	EF	own unpubl. data

<i>Carabus (Meganebrius) everesti everesti</i> Andrewes	CDE	own unpubl. data
<i>Carabus (Meganebrius) everesti kleinfeldi</i> Korell	CDE	own unpubl. data
<i>Carabus (Meganebrius) franzi</i> Mandl	BC	own unpubl. data
<i>Carabus (Meganebrius) granulocostatus</i> Mandl	BC	own unpubl. data
<i>Carabus (Meganebrius) indicus</i> Fairmaire	BC	own unpubl. data
<i>Carabus (Meganebrius) kadoudali</i> Morvan	C	own unpubl. data
<i>Carabus (Meganebrius) koganae</i> Colas	CDE	own unpubl. data
<i>Carabus (Meganebrius) lebrethae densestriolatus</i> Mandl	BC	own unpubl. data
<i>Carabus (Meganebrius) lebrethae lebrethae</i> Colas	BCD	own unpubl. data
<i>Carabus (Meganebrius) montreuili</i> Deuve	CD	own unpubl. data
<i>Carabus (Meganebrius) montreuili</i> Deuve	CD	own unpubl. data
<i>Carabus (Meganebrius) pseudoharmandi</i> Mandl	BC	own unpubl. data
<i>Carabus (Meganebrius) queinneci</i> Deuve	DE	own unpubl. data
<i>Carabus (Meganebrius) quinlani brittoni</i> Mandl	BCD	own unpubl. data
<i>Carabus (Meganebrius) quinlani himalchuliensis</i> Lassalle	BCD	own unpubl. data
<i>Carabus (Meganebrius) quinlani quinlani</i> Mandl	BCD	own unpubl. data
<i>Carabus (Meganebrius) quinlani smetanai</i> Häckel & Brezina	BC	own unpubl. data
<i>Carabus (Meganebrius) salpansis</i> Deuve	CD	own unpubl. data
<i>Carabus (Meganebrius) santostamangi santostamangi</i> Deuve & Schmidt	CD	own unpubl. data
<i>Carabus (Meganebrius) santostamangi thanglaensis</i> Deuve & Schmidt	DE	own unpubl. data
<i>Carabus (Meganebrius) scheibei</i> Eidam	CD	own unpubl. data
<i>Carabus (Meganebrius) sp.n. near granulocostatus</i>	C	own unpubl. data
<i>Carabus (Meganebrius) tamang gorkhaorum</i> Lassalle	BC	own unpubl. data
<i>Carabus (Meganebrius) tamang probsti</i> Deuve	C	own unpubl. data
<i>Carabus (Meganebrius) tamang tamang</i> Deuve	BCD	own unpubl. data
<i>Carabus (Meganebrius) thudamensis</i> Deuve & Schmidt	D	own unpubl. data
<i>Carabus (Meganebrius) tuberculipennis ganjalaensis</i> Deuve	EF	own unpubl. data
<i>Carabus (Meganebrius) tuberculipennis ssp.n.</i>	EF	own unpubl. data
<i>Carabus (Meganebrius) tuberculipennis tuberculipennis</i> Mandl	EF	own unpubl. data
<i>Carabus (Meganebrius) wallichi</i> Hope	BC	own unpubl. data
<i>Carabus (Megodontus) germanii</i> Sturm	CD	[5]
<i>Carabus (Megodontus) violaceus dryas</i> Gistel	CD	[5]
<i>Carabus (Megodontus) violaceus purpurascens</i> Fabricius	CD	[5]
<i>Carabus (Megodontus) violaceus violaceus</i> L.	CD	[5]
<i>Carabus (Mesocarabus) dufourii</i> Dejean	BC	[5]
<i>Carabus (Mesocarabus) lusitanicus lusitanicus</i> Fabricius	BC	[5]
<i>Carabus (Mesocarabus) macrocephalus</i> Dejean	CD	[5]
<i>Carabus (Mesocarabus) problematicus andorranus</i> Lapouge	DE	[5]
<i>Carabus (Mesocarabus) problematicus problematicus</i> Herbst	CDE	[5]
<i>Carabus (Mesocarabus) riffensis</i> Fairmaire	B	[2]
<i>Carabus (Mimocarabus) maurus</i> (Adams)	C	[2, 7, 8]
<i>Carabus (Neoplesius) borodini</i> Heinz	EF	own unpubl. data
<i>Carabus (Neoplesius) danae</i> Kaláb	EF	own unpubl. data
<i>Carabus (Neoplesius) nanschanicus nocticolor</i> Deuve & Kaláb	DE	[2–4]
<i>Carabus (Neoplesius) paulusi kocmani</i> Kaláb	EF	own unpubl. data
<i>Carabus (Neoplesius) paulusi paulusi</i> Kaláb	EF	own unpubl. data
<i>Carabus (Neoplesius) waga folwarznyi</i> Deuve	EF	own unpubl. data
<i>Carabus (Neoplesius) waga glasunowi</i> Heinz	EF	own unpubl. data
<i>Carabus (Neoplesius) waga glinkai</i> Heinz	EF	own unpubl. data
<i>Carabus (Neoplesius) waga mustangensis</i> Deuve	EF	own unpubl. data
<i>Carabus (Neoplesius) waga nyalamensis</i> Deuve	EF	own unpubl. data
<i>Carabus (Neoplesius) waga tanguticus</i> Semenov	EF	[2], own unpubl. data
<i>Carabus (Neoplesius) waga waga</i> Fairmaire	EF	[2], own unpubl. data
<i>Carabus (Nesaeocarabus) abbreviatus</i> Brullé	C	[5]
<i>Carabus (Ophiocarabus) latiballioni</i> Deuve	CDE	[2, 6]
<i>Carabus (Ophiocarabus) praecox</i> Semenov	CDE	[2, 6]

<i>Carabus (Ophiocarabus) tekesensis</i> Deuve & Tian	CDE	[2, 6]
<i>Carabus (Orinocarabus) alpestris dolomitanus</i> Mandl	EF	[5]
<i>Carabus (Orinocarabus) baudii</i> Kraatz	EF	[5]
<i>Carabus (Orinocarabus) concolor</i> Fabricius	EF	[5]
<i>Carabus (Orinocarabus) heteromorphus</i> Daniel	EF	[5]
<i>Carabus (Orinocarabus) sylvestris</i> Panzer	CDE	[5]
<i>Carabus (Pachystus) glabratus</i> Paykull	CDE	[5]
<i>Carabus (Pachystus) hortensis</i> L.	C	[5]
<i>Carabus (Pachystus) preslii neumeyeri</i> Schaum	BC	[5]
<i>Carabus (Pagocarabus) crassesculptus</i> Kraatz	CDE	[2–4]
<i>Carabus (Piocarabus) reitterianus</i> Breuning	C	[2–4]
<i>Carabus (Piocarabus) titanus</i> Breuning	C	[2–4]
<i>Carabus (Platycarabus) creutzeri</i> Fabricius	CDE	[5]
<i>Carabus (Platycarabus) depressus</i> Bonelli	CDE	[5]
<i>Carabus (Platycarabus) irregularis</i> Fabricius	CD	[5]
<i>Carabus (Procrustes) coriaceus</i> L.	BC	[5]
<i>Carabus (Pseudocranion) gansuensis</i> Semenov	CDE	[2–4]
<i>Carabus (Pseudocranion) sackeni remondianus</i> Deuve	DE	[2–4]
<i>Carabus (Pseudocranion) tibetanophilus yak</i> Deuve	DE	[2–4]
<i>Carabus (Rhigocarabus) buddaicus gansuicus</i> Deuve	DE	[2–4]
<i>Carabus (Rhigocarabus) cateniger</i> Morawitz	DE	[2–4]
<i>Carabus (Rhigocarabus) gracilicollis shatanensis</i> Deuve & Tian	D	[2–4]
<i>Carabus (Rhigocarabus) ladygini</i> Semenov	EF	[2–4], own unpubl. data
<i>Carabus (Rhigocarabus) morawitzianus</i> Semenov	EF	[2–4], own unpubl. data
<i>Carabus (Rhigocarabus) roborowskii</i> Semenov	EF	[2–4], own unpubl. data
<i>Carabus (Rhigocarabus) xiei abaxianensis</i> Deuve & Tian	DE	[2–4]
<i>Carabus (Sphodristocarabus) armeniacus</i> Mannerheim	CDE	[2, 7, 9]
<i>Carabus (Tachypus) auratus</i> L.	CD	[5]
<i>Carabus (Tomocarabus) convexus convexus</i> Fabricius	BC	[5]
<i>Carabus (Tomocarabus) convexus hornschi</i> Hoppe	BC	[5]
<i>Carabus (Tomocarabus) fraterculus jirisanensis</i> Ishikawa & Kim	C	[2–4]
<i>Carabus (Tomocarabus) rumelicus syriensis</i> Breuning	C	[2, 10]
<i>Carabus (Ulocarabus) theanus</i> Reitter	CD	[2]
<i>Cychrus (Cychropsis) mandli</i> (Paulus)	DEF	own unpubl. data
<i>Cychrus (Cychrus) atenuatus</i> (Fabricius)	CD	[11, 12]
<i>Cychrus (Cychrus) caraboides</i> (L.)	CD	[11, 12]
<i>Cychrus (Cychrus) kaznakovi tongrenicus</i> Deuve	D	[3]
<i>Cychrus (Cychrus) starcki</i> Reitter	CD	[3]
<i>Cychrus (Cychrus) stoetznerei</i> Roeschke	D	[3]

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