

Illustrated key to the genera of ground and tiger beetles of Galápagos (Coleoptera, Carabidae)

by Konjev DESENDER

Abstract

An illustrated key is given to the genera of Carabidae (incl. Cicindelinae) of the Galápagos Archipelago (Ecuador). Original habitus figures are added for Galápagos species of each of the 15 genera actually known to the Archipelago. Four genera are mentioned for the first time in Galápagos.

Key words: Galápagos, Carabidae, genera identification key

Résumé

Une clef d'identification illustrée est présentée sur les genres de Carabidae (incl. Cicindelinae) des îles Galápagos (Ecuador). Des figures originales d'habitus (espèces de Galápagos) sont ajoutées pour chacun des 15 genres actuellement connus des îles. Quatre genres sont mentionnés pour la première fois aux îles Galápagos.

Mots-clefs: Galápagos, Carabidae, clef d'identification des genres

Introduction

Studies on the beetles and spiders of Galápagos were started in the eighties at the Royal Belgian Institute for Natural Sciences and have been continued since (reviewed by BAERT *et al.*, 1994; BAERT, 2000). During the last decade, other research groups joined these efforts on the study of the terrestrial invertebrates of the archipelago (Schatz & Schatz, Peck & co-workers; cf. PECK, 1996). As a result, several taxa, including the ground and tiger beetles (DESENDER *et al.*, 1992a) are fairly well-known today. Galápagos invertebrates are much more species-rich than vertebrates, in many taxa demonstrate high levels of endemism, show a large variation of life cycles, distribution and geographical range sizes and suggest a variety of speciation scenarios (DESENDER *et al.*, 1992a; PECK, 1996).

The first detailed account on Galápagos ground and tiger beetles (Carabidae, including Cicindelinae) was given by VAN DYKE (1953), who treated some 25 species. Some 15 years later, BASILEWSKY (1968) revised the Galápagos Calosomini. PECK & PUKALOVA-PECK (1990) mentioned 35 ground and tiger beetles for the Galápagos. DESENDER *et al.* (1992a) treated some 40 species belonging to 11 genera, while mentioning uncertainties for the exact number of species belonging to the genera *Agonum*, *Bradycellus*, *Pterostichus*, *Selenophorus* and *Tachys*. More recently collected material (Desender & co-workers, unpublished data) yielded members from 4 additional genera to

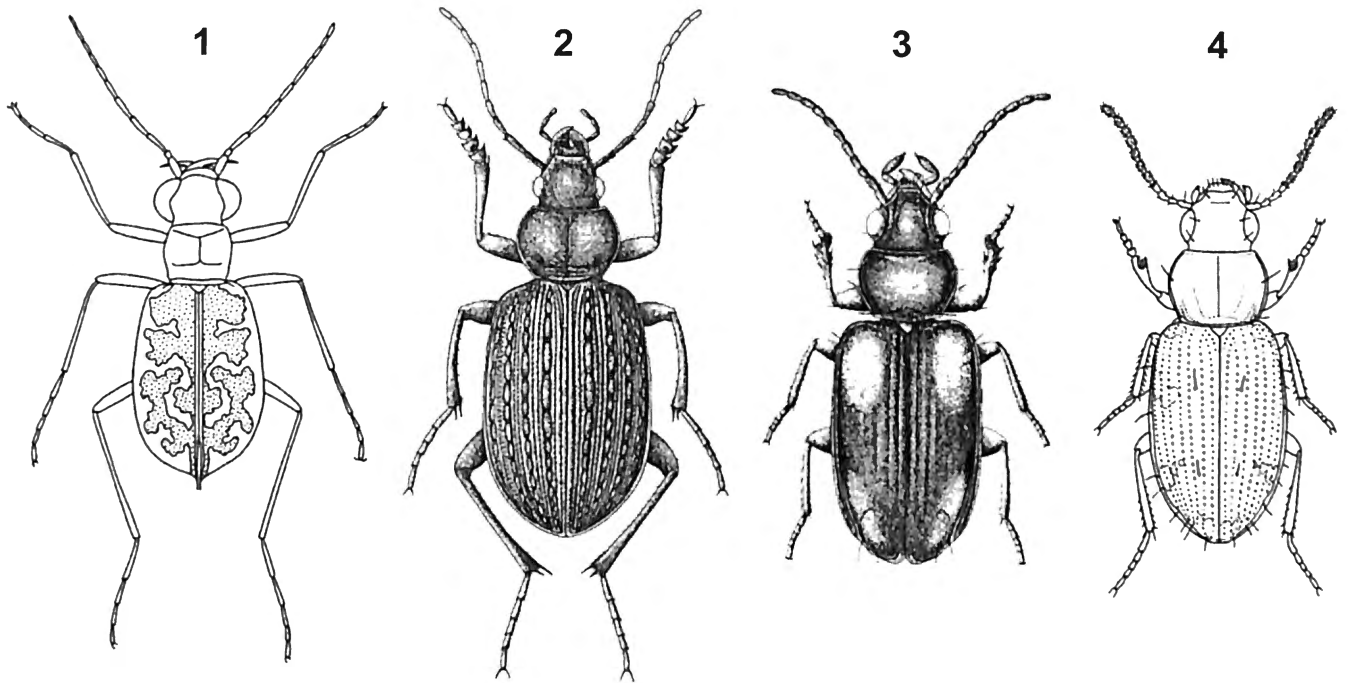
this ground beetle list: these most probably include several species recently introduced to the Archipelago (see also DESENDER *et al.*, 1992b; DESENDER *et al.*, in press). In summary, ground and tiger beetles belong to one of the largest beetle families in the Galápagos, with some 40-45 species. Patterns of distribution and speciation of several Galápagos ground beetles were already discussed in an earlier paper (DESENDER *et al.*, 1992a).

Today, many taxonomic/systematic problems remain unresolved in Galápagos ground beetles, partly as a result of unreliable or incomplete descriptions by others in the past. We recently also started studying these by means of molecular techniques (e.g. DESENDER & VERDYCK, 2000). In most of the Galápagos ground beetle genera, systematic, ecological and molecular studies are therefore still in progress (Desender & co-workers).

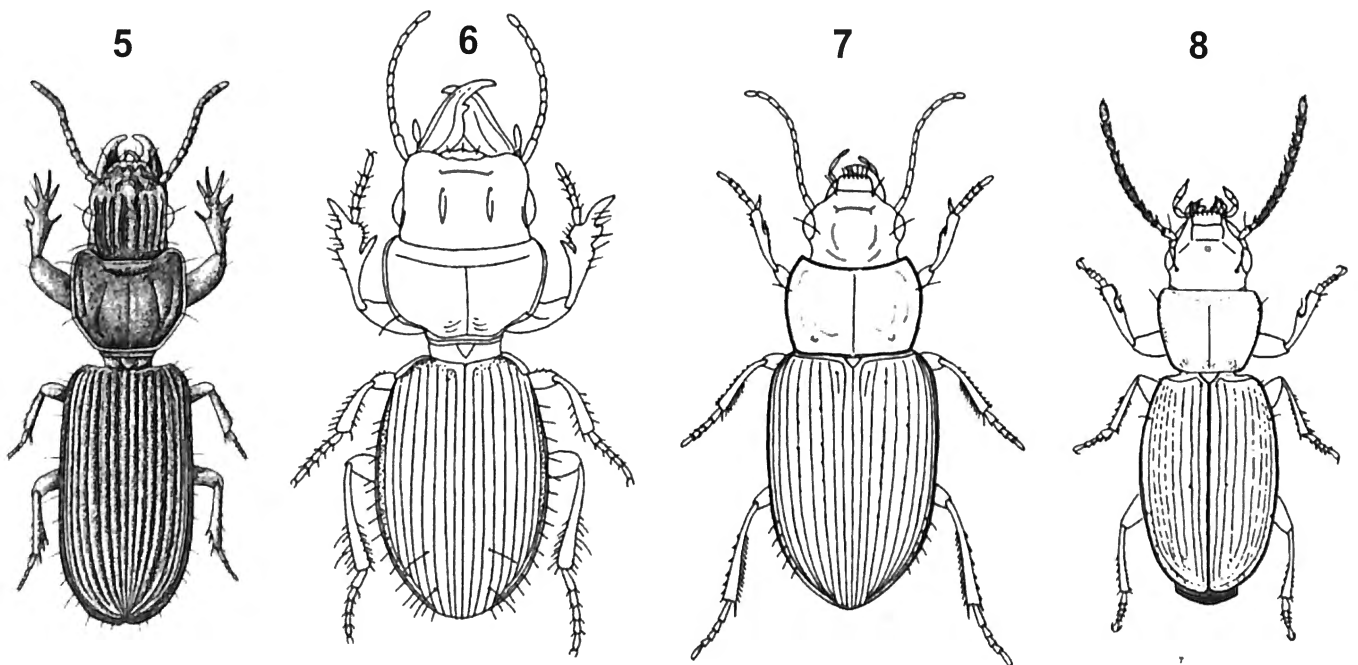
Also because of the increased introduction of alien species during recent decades in Galápagos, there is a growing need for an identification key and an updated recent checklist of the Galápagos species in this beetle family. As, at this moment, a reliable and complete checklist cannot yet be given with much confidence, we have started, as a first step, to prepare an illustrated key to all genera of ground and tiger beetles, currently known to us from Galápagos. This is the objective of this short paper. The main purpose is to stimulate and make easier future monitoring studies in Galápagos. The key should enable entomology students or scientists, unfamiliar with Carabid systematics, to identify, at least with certainty to genus level, any of the ground and tiger beetles, currently known to us from Galápagos.

Detailed keys to species level are in preparation (DESENDER & PECK, in prep.) and will be included in the planned comprehensive treatment of all Galápagos beetles (PECK, in prep.). An updated checklist is also planned for the near future (DESENDER, in prep.).

In the following key to the Galápagos carabid genera, all 15 genera are illustrated by a Galápagos species (original figures). Nomenclature primarily follows REICHARDT (1977). Names between brackets refer to genus or subgenus names used by other authors, but also mentioned in REICHARDT (1977). Four of these 15 genera have never been mentioned before for Galápagos: *Acupalpus*, *Calleida*, *Hallocoryza* and *Thalpius*.



Figs. 1-4 — Habitus of Galápagos species belonging to the genus (1) *Cicindela* (TL [total length] = 8,5-14,5 mm), (2) *Calosoma* (TL = 12-23 mm), (3) *Tachys* (TL = 1,5-3,5 mm) and (4) *Bembidion* (TL = 2,5-3,5 mm).



Figs. 5-8 — Habitus of Galápagos species belonging to the genus (5) *Halocoryza* (total length = 2-2,5 mm), (6) *Scarites* (TL = 16-25 mm), (7) *Selenophorus* (TL = 7-11 mm) and (8) *Bradycellus* (TL = 2,5-4 mm).

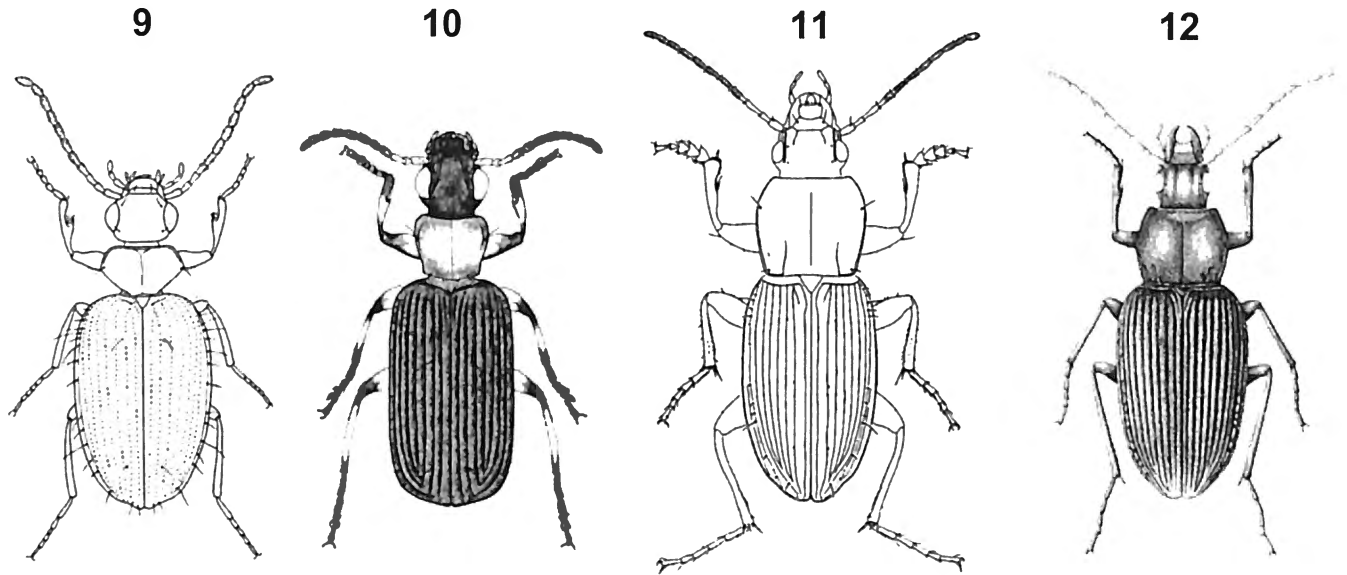
Illustrated identification key to the genera of ground and tiger beetles of Galápagos

- 1a. Clypeus broader than distance between antennal insertions (tiger beetles); elytra without striae and glabrous (Fig. 1) *Cicindela* LINNAEUS, 1758
 (*Cicindelidia* RIVALIER, 1954)
- 1b. Clypeus narrower than distance between antennal insertions; elytra mostly with striae (sometimes diffuse) or pubescent 2
- 2a. Elytron with more than 12 striae and 3 tuberculate intervals (Fig. 2); fore coxal cavities open behind
 *Calosoma* WEBER, 1801
 (*Castrida* MOTSCHULSKY, 1865)
- 2b. Elytron with less than 11 striae (abbreviated scutellar stria not counted) or without striae; fore coxal cavities closed behind 3
- 3a. Pronotum and elytral intervals pubescent, each at least with one row of setiferous punctures 14
- 3b. Pronotum and elytra glabrous (except for apical or lateral setae and dorsal punctures in at most three intervals) . 4
- 4a. Last segment of maxillary palp at most about a third as long as preceding one; total length not exceeding 4 mm5
- 4b. Last segment of maxillary palpi about as long or longer than preceding one 6
- 5a. Elytra without scutellar stria; sutural stria extended and hooked (recurrent) along apex (use light source from behind) (Fig. 3) *Tachys* STEPHENS, 1828
- 5b. Elytra with scutellar stria and more strongly punctuated striae; sutural stria not recurrent (Fig. 4)
 *Bembidion* (*sensu lato*) LATREILLE, 1802
- 6a. Forebody pedunculate (scutellum situated entirely in front of elytra); fossorial carabids with enlarged protibia . . 7
- 6b. Scutellum at least partly situated between elytra; normal protibia and body 8
- 7a. Frons with two supra-orbital punctures (with setae); head capsule with 8 distinct longitudinal ridges; mandibles simple, smaller than 3 mm (Fig. 5)
 *Halocoryza* ALLUAUD, 1919
- 7b. Frons without supra-orbital punctures; enlarged mandibles with extra teeth; stout beetles, larger than 15 mm (Fig. 6) *Scarites* FABRICIUS, 1775
- 8a. Frons with one supra-orbital puncture (and accompanying large seta) near eye 9
- 8b. Frons with two supraorbital punctures near eye (punctures always visible even if setae are broken) 11
- 9a. Elytral striae 2, 5 and 7 mostly with setigerous punctures; mentum without tooth; body larger (mostly over 7 mm) (Fig. 7) *Selenophorus* DEJEAN, 1829
- 9b. Elytral with striae 2, 5 and 7 impunctate; body smaller

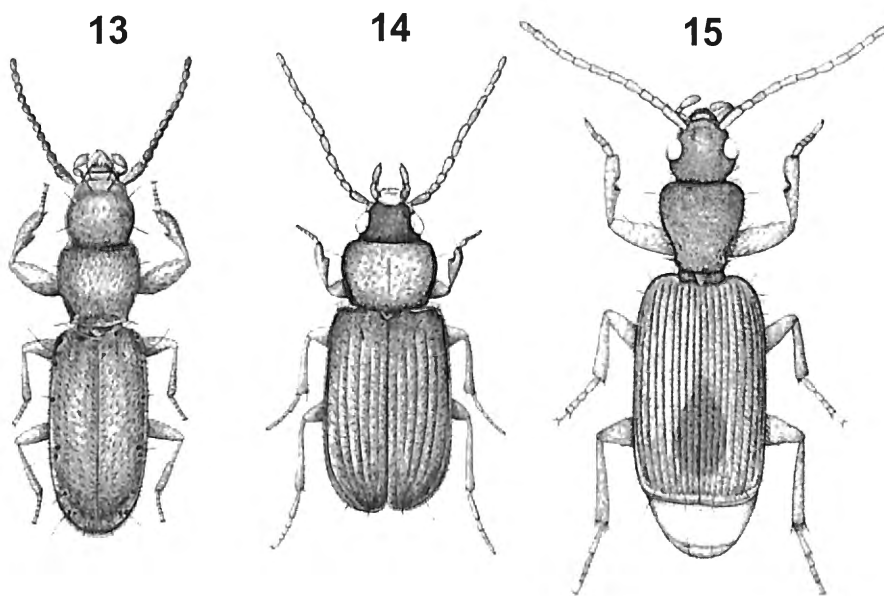
- (less than 5 mm) 10
- 10a. Mentum without tooth; 2 to 4 mm (Fig. 14)
 *Acupalpus* LATREILLE, 1829
- 10b. Mentum with tooth; 2,5 to 4 mm (Fig. 8)
 *Bradycellus* ERICHSON, 1837
- 11a. Pronotum pentagonal with lateral sides protruding at middle; head markedly constricted at neck, eyes very much protruding (Fig. 9). *Pentagonica* SCHMIDT-GOEBEL, 1846
- 11b. Pronotum with lateral sides not protruding at middle; eyes normal 12
- 12a. Apex of elytra transversely truncate; tarsal claws pectinate; conspicuously bicoloured beetles with dark head, orange pronotum and metallic green-blue elytra (Fig. 10)
 *Calleida* DEJEAN, 1825
- 12b. Apex of elytra rounded; tarsal claws simple 13
- 13a. Elytra with epipleura crossed near apex (Fig. 11)
 *Pterostichus* (*sensu lato*) BONELLI, 1810
 (*Blennidus* MOTSCHULSKY, 1865)
- 13b. Elytra with epipleura not crossed near apex (Fig. 12) . .
 *Platynus* (*sensu lato*) BONELLI, 1809
 (*Dyscolus* DEJEAN, 1831)
- 14a. Eyes absent; last segment of maxillary palp much shorter than preceding one; very small, not over 1,5 mm (Fig. 13)
 *Mystroceridius* REICHARDT, 1970
- 14b. Eyes present; small to medium-sized beetles. 15
- 15a. Frons with a single seta-bearing supra-orbital puncture inside eye; elytra rounded at apex; very small (2 mm), pale beetles with entirely pubescent antenna (Fig. 14) . .
 *Acupalpus* LATREILLE, 1829
- 15b. Frons with two supra-orbital punctures inside eye; antenna pubescent from second segment onwards; elytra truncate at apex, about 4,5-6 mm (Fig. 15)
 *Thalpius* LE CONTE, 1851

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Figs. 9-12 — Habitus of Galápagos species belonging to the genus (9) *Pentagonica* (total length = 4-5 mm), (10) *Calleida* (TL = 6,5-7 mm), (11) *Pterostichus* (TL = 9-13 mm) and (12) *Agonum* (*Dyscolus*) (TL = 7,5-13 mm).



Figs. 13-15 — Habitus of Galápagos species belonging to the genus (13) *Mystroceridius* (total length = 1-1,3 mm), (14) *Acupalpus* (TL = 2-4 mm) and (15) *Thalpius* (TL = 4,5-6 mm).

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