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Pachybrachis pallens Blanchard 1851 collected by Charles DARWIN and more new records and a new species of Neotropical Pachybrachina

(Coleoptera: Chrysomelidae: Cryptocephalinae)

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Abstract: A specimen of *Pachybrachis pallens* Blanchard, 1851 collected by Charles DARWIN in Valparaiso, Chile, during his voyage with the Beagle was traced. Male and female genitalia of *P. pallens* are figured for the first time. A new species similar to *P. pallens*, *P. darwini* **n. sp.** from Peru is described. *P. dissolutus* Suffrian, 1866 is recorded for the first time from Venezuela. The genus *Acolastus* is recorded for the first time from the Neotropical region, with the exotic species *Acolastus arabicus* (Lopatin, 1982) originating from Oman collected in Trinidad and Tobago, West Indies. This is the first case of an invasive Palaearctic species of Cryptocephalinae in the Americas.

Key words: Chrysomelidae, *Pachybrachis*, *Acolastus*, Palaearctic, Neotropic, Chile, Trinidad, Arabia, new species, invasive species

Introduction

The subtribe Pachybrachina of Cryptocephalinae is represented by seven genera and approximately 350 described species in the Neotropical region, amongst them the genus *Pachybrachis* Chevrolat, 1832 with 126 species (BLACKWELDER 1946). In this study, a new species of *Pachybrachis* from Peru is described, and new records of Pachybrachina from Chile, Venezuela and Trinidad and Tobago are given.

Materials and Methods

Included in this study are specimens located in the following collections.
BMNH = Natural History Museum, London, Great Britain (S. SHUTE)
MESC = Matthias SCHÖLLER personal collection, Berlin, Germany.
UHPC = Uwe HEINIG personal collection, Berlin, Germany.
ZMHUB = Museum für Naturkunde der Humboldt-Universität, Berlin (J. FRISCH, M. UHLIG).
Abbreviations used: spm = specimen; m = male, f = female.

Results

Pachybrachis pallens Blanchard, 1851

Pachybrachis pallens Blanchard, 1851:541; Type locality: Santiago de Chile.
1 spm (BMNH): Chile, Valparaiso, C. DARWIN, DARWIN Coll. 1885-119.

Note: As a child, Charles Darwin already collected beetles. During his voyage around the world on the Beagle he collected hundreds of different types of fossils, plants, and animals including beetles (NEFFE 2008). This is a yet unidentified specimen collected by DARWIN during the voyage with the Beagle. DARWIN stayed at Valparaiso (33.05°S, 71.617°W) in the house of a school friend from Great Britain. He collected in Valparaiso and in the surroundings from July 23rd to November 10th 1834 (DARWIN, 1839:309).
Additional specimens studied: 1m 2f (MESC): Chili, Nebel (specimens figured); 1f (ZMHUB): Chile, Contulmo, Prov. Concepcion, Schönemann 1904-5 [Arauco province, region del Bio-Bio, 38°1′S, 73°14′W], 1f (DEI): Chili, Kraatz, 1f (DEI): Chili, Germain.

Pachybrachis pallens was redescribed in detail by SUFFRIAN (1866). He placed it in his largest species-group 1. In the species-group concept of FALL (1915), it would be placed in group B. In the following, a revised diagnosis and additional characters including male and female genitalia are given.

Revised diagnosis

A medium-sized pale yellow species with thorax partly black, with large eyes, ocular lines, glabrous elytra without microsculpture and without elevated markings, epimeron of mesothorax yellow, armed tibiae, second tarsomere almost as long as first tarsomere, male first tarsomere of

fore leg simple and with asymmetrical claws, ratio of female interocular space : eye length 1.0 : 1.0, aedeagus ventrally regularly vaulted, and apex triangular.

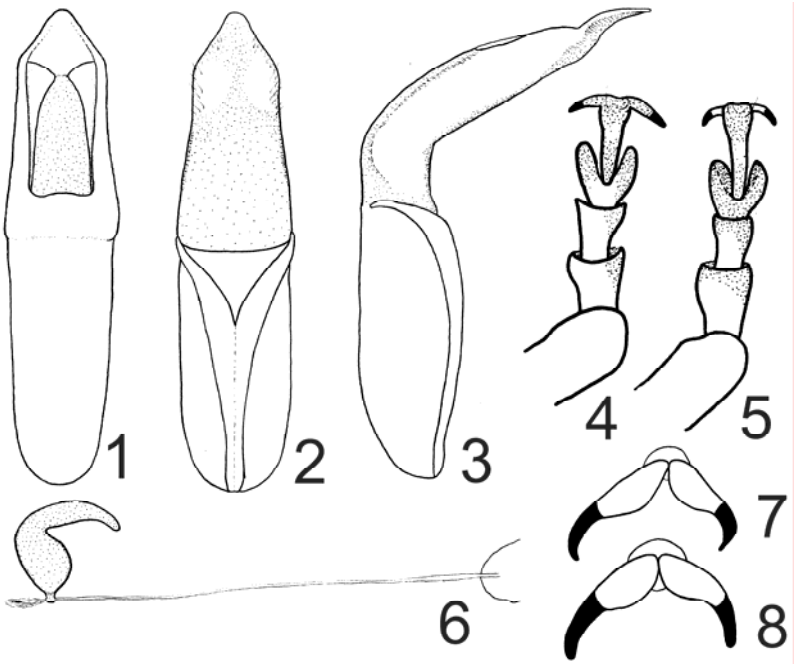
Head. Eyes moderately convex in female (Fig. 17b), ratio width of eyes in frontal view : length of line from apical margin of clypeus to upper rim of eye as 1.71 : 1.0.

Thorax: Pronotum and elytra without micropunctures, only few pronotal interstices convex, additional punctures present on elytral interstice 9 between row abutting elytral margin and last elytral row of punctures, submarginal elytral interstice slightly convex, front- and mid femur with tibial spur, first segment of fore tarsus simple in male (Fig. 4) and female (Fig. 5), not wider than first tarsomere of mid- and hind leg, first tarsomere of male hind leg as long as the following two segments combined, claws large, claws of fore leg strongly asymmetric in male (Fig. 7), almost symmetrical in female (Fig. 8).

Abdomen: Length of aedeagus 0.85 mm, aedeagus in lateral view strongly angulate, slender, dorsally incised before apex (Fig. 3), apex of aedeagus triangular, ostium at widest point narrower than base of aedeagus, a pair of long lateral triangular frenulae present, no additional endosclerite visible (Fig. 1), apex ventrally regularly vaulted, with a pair of feeble swellings in apical 1/3 (Fig. 2); kotpresse as in *P. hieroglyphicus* (Laicharting, 1781), sclerites black; spermathecal duct straight, fragile, not pigmented, base not modified, spermatheca weakly pigmented, the spermathecal recaptacle is inflated and the pump is as long as receptacle, inner margin narrowly triangular in lateral view (Fig. 6), eimörser shallow, shiny, impunctate, ratio length : width 1.0 : 0.8.

Size [mm]: (mean±SD (max., min., n)): length of male 2.72±0.26 (3.00, 3.50, 3), female 3.05±0.029 (3.40, 2.70, 5), width of elytra at humeri in male 1.23±0.16 (1.45, 1.15), female 1.58±0.139 (1.75, 1.40), length of elytra in male 1.78±0.15 (1.95, 1.65), female 2.03±0.202 (2.15, 1.80), length of pronotum in male 0.87±0.076 (0.95, 0.80), width 1.17±0.076 (1.25, 1.10), length of pronotum in female 0.95±0.122 (1.10, 0.80) and width 1.31±0.114 (1.45, 1.20).

Distribution and biology: Known from Chile only. No information on the biology is available.



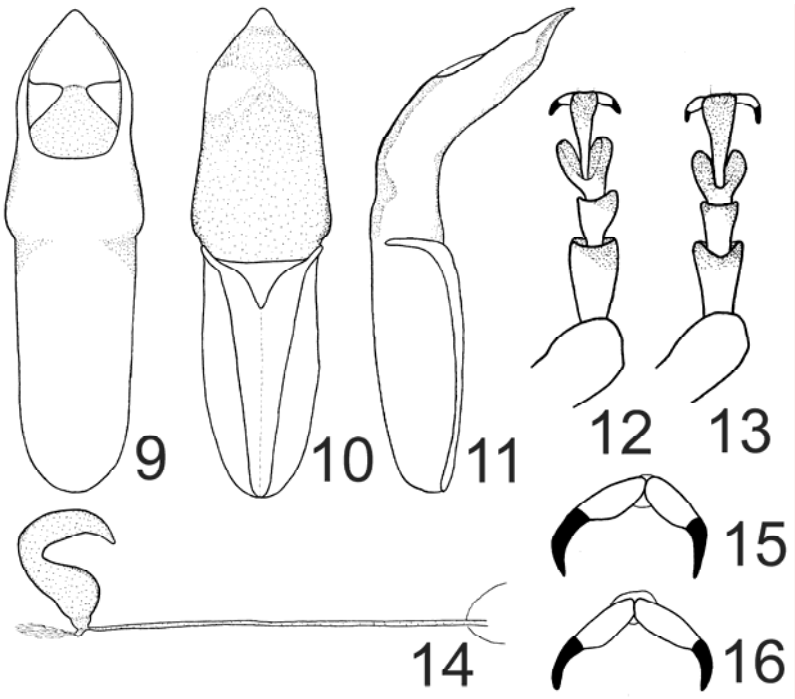
Figs 1–8: *Pachybrachis pallens* Blanchard; 1–3 aedeagus, 1) dorsal, 2) ventral, 3) lateral; 4–5 left fore tarsus, 4) male, 5) female; 6) spermatheca and spermathecal duct; 7–8 claw of left fore tarsus, 7) male, 8) female.

***Pachybrachis darwini* n. sp.**

Holotypus (male, ZMHUB): Peru, Lima, Vaquero lg. (ink) [white] / Holotypus *Pachybrachis darwini* des. Matthias Schöller [red] /.

2 Paratypes: 1 f (ZMHUB): Peru, Lima, Vaquero lg. (ink) [white] /; 1 f (BMNH): / Peru: Chancay, shrubs nr. river, 40miles N. of Lima, 29. vii.1971 [white with green line] / Fertile irrigated region in arid coastal desert [white] / P.S.&H.L. Broomfield B.M.1971-486. [white] /; all with my label Paratypus *Pachybrachis darwini* des. Matthias Schöller [red] /.

Type locality: Lima, Peru (12°.04'S 77°03'W), the more specific paratype record Chancay is 11°33'S 77°16'W.



Figs 9–16: *Pachybrachis darwini* **n. sp.**; 9–11 aedeagus, 9) dorsal, 10) ventral, 11) lateral; 12–13 left fore tarsus, 12) male, 13) female; 14 spermatheca and spermathecal duct; 15–16 claw of left fore tarsus, 15) male, 16) female.

Diagnosis

A medium-sized dark yellow species with thorax partly black, with large eyes, ocular lines, glabrous elytra without microsculpture and without elevated markings, epimeron of mesothorax yellow, armed tibiae, second tarsomere distinctly shorter than first tarsomere, male first tarsomere of fore leg simple and with claws almost symmetrical, ratio of female interocular space : eye length 1.15 : 1.0, aedeagus ventrally regularly vaulted, and apex triangular.

Description of holotype (male)

Habitus. Body medium-sized, shape cylindrical-oval, size [mm]: length 3.3, length of pronotum 1.05, width 1.45, length of elytra 2.1, width at humeri 1.5.

Head. Dark yellow, above the antennal base, and lateral and apical margins of clypeus brown, labrum light yellow, neck behind the eyes deep black, head with coarse sparse punctures, more dense on vertex, glabrous except for some short setae above scape, eyes with blunt canthus, broadly triangular, front with ocular lines (sensu FALL 1915), eyes large and upper lobes moderately close, therefore ratio of minimum distance between upper lobes to eye length is 1.3 : 1.1; length of antenna 1.8 mm long, 1.7 times pronotal length, antennomeres 1–5 yellow, 6–7 brownish and 8–11 dark brown; mandibles yellow with dark brown tip.

Thorax. Pronotum dark yellow, basal margin brown, glabrous, shiny, but with very fine microsculpture, punctures coarse, dense, shallow and brown at base, interstices mostly narrower than diameter of punctures, most interstices convex (Fig. 17e), all pronotal margins callose, except for central basal extension, basal margin elevated in lateral view; prothorax yellow with apical third beneath coxae dark brown with a yellow spot, prosternal process brownish, mesothorax black with epimeron yellow, a yellow spot on mesosternal process and above each mesocoxa, metathorax black with a pair of large triangular yellow markings and a narrow stripe on epimeron yellow, metathorax with coarse punctures and microsculpture; scutellum yellow with blackish brown margins; elytra glabrous, basal margin of elytra black, not swollen, elytral punctures more or less as large and coarse as on pronotum, elytra with all rows of punctures confused by additional punctures, more confused below scutellum, no scutellar row detectable (Fig. 17c), additional punctures present on interstice 9 between row abutting elytral margin and last elytral row of punctures, punctures blackish brown at base, interstices without micropunctures, plain, only slightly convex laterally and apically, elytra dark yellow, with a feeble brown blurred spot at apex of humerus and some blurred brownish darkenings on interstices on elytral apex, suture blackish brown; epipleural reddish; legs including coxae yellow except for fuscous last tarsomere and claw segment, fore- and mid tibia with tibial spur, fore tibia nearly straight, first segment of fore tarsus simple (Fig. 12), not wider than first tarsomere of mid- and hind leg, first tarsomere of hind leg as long as the following two segments combined, claws of fore leg almost symmetrical (Fig. 15).

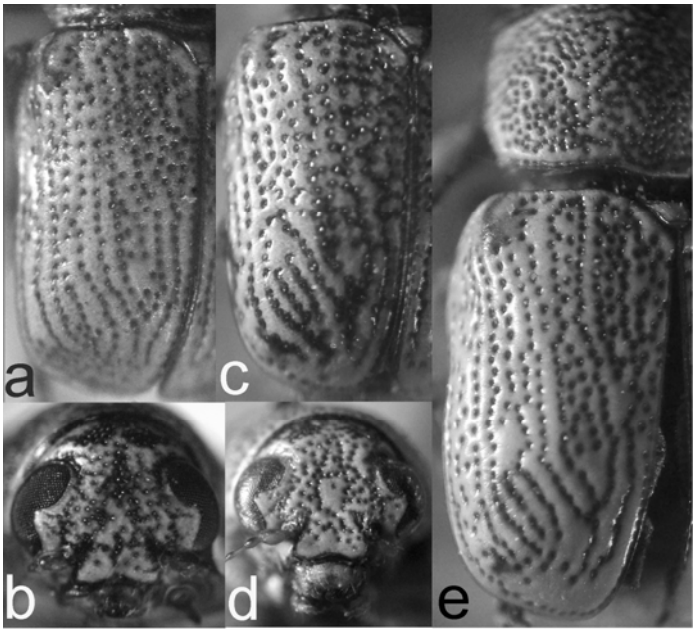


Fig. 17: *Pachybrachis* spp., a–b *P. pallens* Blanchard female, a) left elytron b) head; c–e *P. darwini* **n. sp.** c) male, left elytra d) female head e) female pronotum and left elytron.

Abdomen. Dark yellow, all ventrites basally brownish, apical margin of ventrite V (sternite VII) at centre punctured, not modified, abdomen with coarse punctures, covered with long white setae, pygidium regularly rounded, yellow with long white setae; length of aedeagus 1.0 mm, aedeagus in lateral view gradually bent, dorsally slightly incised before apex (Fig. 11), in dorsal view apex regularly triangular, a pair of frenulae visible in the ostium (Fig. 9), ventrally regularly rounded except for a subapical swelling, apically with a pair of setiferous areas (Fig. 10).

Variability. The elytra may be entirely pale except for small brown marking on humerus, or some elytral interstices may be brown in apical 1/3.

Female: Ratio of female interocular space : eye length 1.15 : 1.0, eyes strongly convex (Fig. 17d), ratio width of eyes in frontal view : length of line from apical margin of clypeus to upper rim of eye as 1.86 : 1.0; of

first segment of fore tarsus as in male, eimörser shallow, as long as wide, abdomen yellow except for black basal margin of ventrite I, pygidium pale yellow, regularly vaulted; the spermathecal duct straight, weakly pigmented, base not modified, spermatheca moderately pigmented, the spermathecal receptacle is inflated and the pump is as long as receptacle, inner margin narrowly triangular in lateral view (Fig. 14), total length of spermatheca and spermathecal duct combined 1.0 mm; kotpresse as in *P. hieroglyphicus*, sclerites dark brown; size [mm]: length 3.75, length of pronotum 1.15, width 1.65, length of elytra 2.5, width at humeri 2.1.

Differential diagnosis. Differs from *P. pallens* Blanchard, 1851 by the larger size, longer first tarsomere of fore leg, more convex pronotal interstices and apical and lateral margins, symmetrical claws of male fore leg, wider female interocular space, and shape of aedeagus; in the smaller species *P. ferrugatus* Suffrian, 1866 from Chile and Peru, the elytral punctures are twice as coarse as the pronotal punctures, and *P. callifer* Suffrian, 1866 from Colombia, a species of similar size, differs in the regular rows of elytral punctures.

Etymology. This species is dedicated to Charles Robert DARWIN (1809–1882) in honour of his 200th birthday on 12 February and the 150th anniversary of his publication "On the origin of species by means of natural selection" in November this year.

Distribution and biology. So far known from the type locality only. One paratype was collected on shrubs near a river in a fertile irrigated region within the arid coastal desert.

Pachybrachis dissolutus Suffrian, 1866

Pachybrachis dissolutus Suffrian, 1866: 425; SCHÖLLER 2005:1555.

1m, 1f (UHPC): Venezuela, Edo. Falcon. Sierra San Luis, nr. Cerro Galicia, 11°10'23,1''N, 69°13'04,3''W, 1248 m, 4.VII.2008, leg. M. HORNBURG.

New for Venezuela.

Acolastus (*Anopsilus*) *arabicus* (Lopatin, 1982)

Thelyterotarsus arabicus Lopatin, 1982:465; MEDVEDEV 1996:222, 241; SCHÖLLER & HEINIG 2006:88; LOPATIN & NESTEROVA 2007:308.

Locus typicus: Gezira el Ghanam, distr. Musandam, Oman.

Specimens studied: 4m, 2f (MESC): Trinidad W.I., Chaguaramas. 25-XI-2005, M.T., leg. C.J. Zwakhals, N:10°43.13' W:61°36.47'.

Genus and species new for Trinidad and Tobago. This is the first record of the genus *Acolastus* from the Neotropical region. A mix-up of the collection label can be excluded in this case.

For a key to Western Palaearctic species see SCHÖLLER & HEINIG (2006), and for figures of the aedeagus see LOPATIN (1982) and LOPATIN & NESTEROVA (2007). The female spermathecal duct is straight and short, the base with a small oval sclerotisation (Fig. 18).

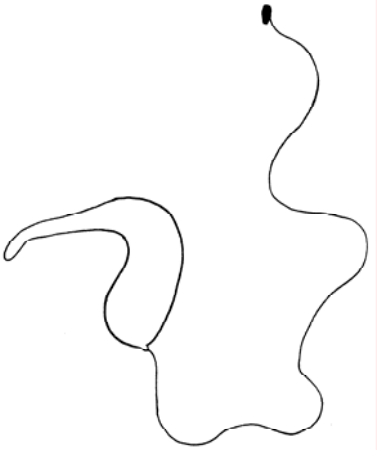


Fig. 18: *Acolastus arabicus* (Lopatin, 1982), spermatheca and spermathecal duct.

This is one of the few species of *Acolastus* that is represented by long series of specimens in museum collections, suggesting that it can build up individual-rich populations. Chaguaramas is the main port of Trinidad and Tobago, the species may have arrived by ship. The biology of this desert species is not know, but it is likely that it is polyphagous as adult and phytosaprophagous as larva. There are only few examples for invasive or translocated species in Cryptocephalinae. BEENEN (2005) listed two species in Chlamisini (one established, one not established), and three in Cryptocephalini: *Diachus auratus* (F.) (Cryptocephalina, established), *Metallactus nigrofasciatus* Suffrian and *M. patagonicus* Suffrian (Pachybrachina, both not established), all originating from the New World. *Acolastus arabicus* (Pachybrachina) is therefore the first case of a Palaearctic Cryptocephalinae species introduced and presumably established in the Neotropical region.

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