

HYDROPHILIDAE:

The genus *Anacaena* THOMSON¹

(Coleoptera)

A. KOMAREK

Abstract

Four new species of *Anacaena* THOMSON (Coleoptera: Hydrophilidae) are described from New Caledonia: *A. novacaledonica* sp.n., *A. rara* sp.n., *A. silvatica* sp.n., and *A. wewalkai* sp.n. *Paranacaena violacea* GENTILI, 1996 is redescribed and transferred to *Anacaena*. A key to the species of *Anacaena* from New Caledonia is presented.

Key words: Coleoptera, Hydrophilidae, *Anacaena*, *Paranacaena*, new species, taxonomy, New Caledonia.

Introduction

Only one species of *Anacaena* THOMSON, 1859, *A. violacea* GENTILI, 1996, was known from New Caledonia so far. It was originally described in the genus *Paranacaena* BLACKBURN, 1888, which was synonymized with *Anacaena* by KOMAREK & BEUTEL (2007).

Anacaena violacea is redescribed herein, and four new species, all endemic to New Caledonia, are described. Distinctive morphological characters are illustrated and a key to all five species is presented.

Material and methods

More than 100 specimens of *Anacaena* from New Caledonia, including the type specimens of *A. violacea* were examined. The male genitalia were dissected, macerated and cleared in concentrated lactic acid and examined several hours later with a light microscope (Olympus BX 41) and a binocular microscope (Leica MZ 12.5) with diffuse and focused light sources. Measurements were taken using a micrometric eyepiece, and ink drawings were made with a drawing tube. The morphological terminology is based on KOMAREK (2004, 2007).

EI (elytral index): relation of greatest elytral length to greatest elytral width

The specimens examined are deposited in the following collections:

AMNY	American Museum of Natural History, New York, USA; L. Herman
IAC	Institut Agronomique Néo-Calédonien, Pocquereux, New Caledonia; S. Cazères, C. Mille
MHNG	Muséum d'Histoire naturelle, Genève, Switzerland; G. Cuccodoro
MNHW	Museum of Natural History, Wrocław University, Poland; M. Wanat
MSNV	Museo Civico di Storia Naturale, Verona, Italy; E. Gentili
NMW	Naturhistorisches Museum Wien, Vienna, Austria
NZAC	New Zealand Arthropod Collection, Auckland, New Zealand; R.A.B. Leschen

¹ Taxonomic revision of *Anacaena* THOMSON, 1859 (part VI).

List of Localities

(Locs. 2001/NC: leg. Balke & Wewalka, Locs. 2009/NC: leg. Jäch)

- Loc. 2001/NC 3:** Dumbéa, 50 m a.s.l., near road to Mt. Koghi, 3.XI.2001. Slowly flowing stream (max. 2 m wide and 40 cm deep), partly shaded, edge with leaf packs and roots, ground sandy and gravelly.
- Loc. 2001/NC 5** (JÄCH & BALKE 2010: Fig. 9): Dumbéa, 150 m a.s.l., upper course of River Dumbéa, 4.XI.2001. Large river, 10–20 m wide and max. 3–4 m deep, slowly flowing, sun exposed, beetles taken from water holes on gravel banks and a ditch on dirt road close to the river.
- Loc. 2001/NC 29:** 20–30 km west of Poindimié, ca. 350 m a.s.l., 13.XI.2001. Small stream, water almost stagnant, turbid, max. 1 m deep, ground slightly muddy, edges sandy, with clay and with thick mats of vegetation.
- Loc. 2001/NC 33:** Aoupinié, 15 km SW Ponérihouen, 500–700 m a.s.l., 14.XI.2001. Stream bed in montane forest, slope very steep and rocky; water almost stagnant but clear, small residual pools with leaves and root mats.
- Loc. 2001/NC 36:** 5–10 km south of Kouaoua, Creek des Orangers, 180 m a.s.l., 15.XI.2001. Stream (max. 2–4 m wide), in deep creek besides road, partly shaded, with pools (max. 1.5 m deep), ground rocky/gravelly, with slow flowing sections, banks sandy/gravelly, in part with leaves.
- Loc. 2001/NC 37:** Mt. Canala, 15–20 km south of Canala, 600 m a.s.l., 15.XI.2001. Puddle in otherwise dry stream bed, montane forest, shaded, stream bed comparably level but with some cascades up to 2 m high.
- Loc. 2001/NC 39:** 20 km east of Canala, 100 m a.s.l., 15.XI.2001. River (max. 10 m wide, 1 m deep), water clean and cool, with large pools, hardly shaded, edge with leaf packs and gravel.
- Loc. 2001/NC 40:** 16 km west of Thio, 350 m a.s.l., 16–17.XI.2001. Pool (2 × 1 m wide and more than 50 cm deep) in stream bed formed by concrete ford; unshaded, bottom sandy, with clay, grassy edge, water slightly turbid.
- Loc. 2001/NC 41** (JÄCH & BALKE 2010: Fig. 23): 10 km west of Thio, 50 m a.s.l., 17.XI.2001. Stream on black rock, water clear but only slowly flowing, edge with some leaves.
- Loc. 2001/NC 43:** 18 km north of Bouloupari, 100 m a.s.l., 17.XI.2001. Stream in open land.
- Loc. 2009/NC 3** (JÄCH & BALKE 2010: Fig. 29): Mt. Koghi, ca. 5 km N Nouméa, 135 m a.s.l., 22°10'51.4"S/166°29'32.0"E, 22.XI.2009. Stream, ca. 3 m wide, flowing through disturbed forest.
- Loc. 2009/NC 9** (JÄCH & BALKE 2010: Fig. 33): road Nouméa – Yaté, ca. 20 km NE Nouméa, ca. 220 m a.s.l., 22°12'24"S/166°40'45.6"E, 24.XI.2009. Two small streams, ca. 1–2 m wide, flowing through isolated patch of rainforest.
- Loc. 2009/NC 11** (JÄCH & BALKE 2010: Fig. 34): Mt. Koghi, ca. 5 km N Nouméa, ca. 500–550 m a.s.l., 22°10'33.4"S/166°30'22.7"E, 25.XI.2009. Small streams (1–3 m wide), flowing through forest.
- Loc. 2009/NC 14** (JÄCH & BALKE 2010: Fig. 36): Rivière Bleue Provincial Park, between Pont Germain and Refuge Tristaniopsis, ca. 30 km NE Nouméa, ca. 160–180 m a.s.l., 22°06'03.7"S/166°39'27.8"E, 26.–27.XI.2009. River (Rivière Bleue), ca. 10 m wide, and several left tributaries, ca. 2–5 m wide, all flowing through forest.
- Loc. 2009/NC 16** (JÄCH & BALKE 2010: Fig. 35): Col d'Amieu, ca. 10 km NNW La Foa, ca. 490 m a.s.l., 21°36'39"S/165°48'38"E and ca. 430 m a.s.l., 21°36'52"S/165°48'49.6"E, 28.XI.2009. Small streams (1–3 m wide), flowing through forest.
- Loc. 2009/NC 18** (JÄCH & BALKE 2010: Fig. 37): ca. 2 km NNE Farino, Refuge de Farino – Petite Cascade, ca. 270–340 m a.s.l., 21°38'55"S/165°46'53"E (coordinates taken at Refuge de Farino), 29.XI.2009. Rock pools and residual pools of two very small, almost dry streams (right tributaries of River Farino), flowing through degraded forest.
- Loc. 2009/NC 22** (JÄCH & BALKE 2010: Fig. 41): ca. 2 km NE Sarraméa, near La Cuve, ca. 160 m a.s.l., 21°38'13"S/165°51'53"E, 30.XI.2009. Stream, 5–7 m wide, with large boulders, slowly flowing through forest.
- Loc. 2009/NC 30** (JÄCH & BALKE 2010: Fig. 51): ca. 4 km SW Népoui, ca. 140 m a.s.l., 21°12'48"S/165°06'06"E, 4.XII.2009. Small stream (left tributary of River Népoui), ca. 1–2 m wide, pools and waterfalls, flowing through degraded forest.
- Loc. 2009/NC 33:** Mt. Koghi, ca. 5 km N Nouméa, 325 m a.s.l., 22°10'30"S/166°30'05"E, 5.XII.2009. Stream, ca. 2–10 m wide, cascades and pools in deep gorge, flowing through forest.

Checklist of New Caledonian *Anacaena*

<i>Anacaena novacaledonica</i> sp.n.	New Caledonia (Grande Terre)
<i>Anacaena rara</i> sp.n.	New Caledonia (Grande Terre)
<i>Anacaena silvatica</i> sp.n.	New Caledonia (Grande Terre)
<i>Anacaena violacea</i> GENTILI, 1996	New Caledonia (Grande Terre)
<i>Anacaena wewalkai</i> sp.n.	New Caledonia (Grande Terre)

Key to New Caledonian species of *Anacaena*

- 1 Punctures on pronotum distinctly finer than on elytra; elytral punctures distinctly serially arranged 2
- Punctures on pronotum about as fine as on elytra; elytral punctures largely irregular on anterior portions of elytra, with some indistinctly discernible series on posterior portion 3
- 2 Preocular patches absent; pronotum black with slightly brighter, narrow lateral margins; 1.8–1.9 mm long; terrestrial *violacea*
- Preocular patches present; pronotum light brown with small dark brown central patch; 2.1–2.5 mm long; aquatic *wewalkai*
- 3 Preocular patches absent; clypeus short (Fig. 3); phallobase distinctly shorter than half the length of the parameres (Fig. 8); terrestrial *silvatica*
- Preocular patches present; clypeus large (Figs. 1–2); phallobase at least half as long as parameres (Figs. 6–7); aquatic 4
- 4 Preocular patches small; pronotum dark brown in more than mesal third, with small bright margins; elytra dark brown; basal apophyses less than half as long as main piece of median lobe (Fig. 7); 1.9–2.0 mm long. *rara*
- Preocular patches large; pronotum dark brown in mesal third, light brown in lateral thirds; elytra rufous; basal apophyses more than half as long as main piece of median lobe (Fig. 6); 2.7–3.0 mm long. *novacaledonica*

Anacaena novacaledonica sp.n.

TYPE LOCALITY: New Caledonia, North Province, Aoupinié, 15 km SW of Ponérihouen, ca. 500–700 m a.s.l. (Loc. 2001/NC 33).

TYPE MATERIAL: **Holotype** ♂ (NMW): “New Caled.: North Prov. / 15 km SW Ponérihouen / Aoupinié, 500 – 700 m, / 14. 11. 2001 / leg. Balke & Wewalka (NC 33)”.

Paratypes: 8 exs. (NMW): same locality data as holotype.

1 ♂ (NMW): Loc. 2009/NC 33.

DESCRIPTION: Total length 2.7–3.0 mm, total width 1.6–1.8 mm, EI 1.1–1.2. Habitus: distinctly convex dorsally, moderately wide, not attenuate apically.

Head (Fig. 1): Clypeus and frons dark brown to black, with large yellowish preocular patches. Punctures on clypeus and frons moderately fine, densely distributed, spaces 1–2 × as wide as one puncture. Microsculpture absent. Clypeus large with blunt, distinct anterolateral angles, anterior edge straight. Eyes very slightly emarginate anteriorly. Antenna composed of eight antennomeres. Maxillary palpus moderately slender; palpomere 2 weakly inflated; palpomere 4 without infuscation. Mentum flat with straight lateral margins, very slightly impressed anteriorly, anterior edge not emarginate. Ventral face with distinct setiferous punctures, with weak microsculpture on margins. Labial palpi slender, elongate.

Thorax: Pronotum dark brown in mesal third, light brown in lateral third. Pronotal punctures as fine as on head, with slightly larger interspaces. Prosternum with very short, flat median carina in anterior third. Elytra dark brown, with slightly brighter lateral margins. Setae absent from lateral borders of pronotum and elytra. Callosity on shoulder region absent. Anterior elytral declivity distinct. Sutural stria in posterior 2/3 of elytra in dorsal view. Punctures on elytra moderately fine, as on pronotum; punctures equally sized and with equal interspaces, with denser distribution than on pronotum; punctures largely irregular, with vague tendency to form rows on elytral disc mainly posteriorly. Microsculpture absent. Mesoventrite with distinct, blunt, median triangular tooth. Procoxae without spine-like setae. Legs dark brown, on some parts slightly

brighter than ventrites. Profemur pubescent on proximal 3/4, mesofemur on proximal 2/3 of ventral face; metafemoral pubescence reduced to a narrow stripe at anterior margin and to proximal portion. Metatarsus shorter than metatibia.

Aedeagus (Fig. 6): Phallobase shorter than parameres, slightly longer than wide; manubrium with spine-like extension. Ventral face of phallobase with ventral excision reaching spine-like extension of manubrium. Parameres with distinctly sigmoidal lateral margins, widest at base, narrowing towards midlength, very narrow, almost parallel-sided in apical half. Apices broadly rounded, almost symmetrical, slightly pointing mesad. Ventral bases of parameres fused. Median lobe moderately wide at base, continuously narrowing apicad, with a very short, pointed apex. Median lobe shorter than parameres, corona in apical position, basal apophyses more than twice as long as main piece of median lobe, with short extension into phallobase, pointing mesad. Base of median lobe distinctly connected with parameres by a very blunt tooth.

DIFFERENTIAL DIAGNOSIS: *Anacaena novacaledonica* differs from the similar *A. rara* mainly by the larger size, the larger preocular patches on the clypeus, the larger light brown pronotal margins, and by the aedeagus.

HABITAT: This species was found in streams in mountain rain forests (in pools with foliage and mats of roots with very clear water).

DISTRIBUTION (Fig. 11): Known only from two localities in central and southern Grande Terre.

ETYMOLOGY: The name of the epithet is a latinized adjective (“pertaining to New Caledonia”).

Anacaena rara sp.n.

TYPE LOCALITY: New Caledonia, North Province, 20–30 km W Poindimié, first pass-road to Pombeï, 350 m a.s.l. (Loc. 2001/NC 29).

TYPE MATERIAL: **Holotype** ♂ (NMW): “New Caled.: North Prov. / 20 – 30 km W Poindimié / 350 m , 13. 11. 2001 / leg. Balke & Wewalka (NC 29)“.

Paratypes: 1 ♂, 2 ♀♀ (NMW): same locality data as holotype.

DESCRIPTION: Total length 1.9–2.0 mm, total width 1.0–1.1 mm, EI 1.1–1.2. Habitus: distinctly convex dorsally, moderately wide, not attenuate apicad.

Head (Fig. 2): Clypeus and frons dark brown to black, with small yellowish preocular patches. Punctures on clypeus and frons moderately fine, moderately dense, interspaces 2–4 × as wide as one puncture. Microsculpture absent. Clypeus large with blunt, distinct anterolateral angles, anterior edge straight. Eyes very slightly emarginate anteriorly. Antenna composed of eight antennomeres. Maxillary palpus moderately slender; palpomere 2 weakly inflated; palpomere 4 without infuscation. Mentum flat with straight lateral margins, very slightly impressed anteriorly, anterior edge slightly emarginate. Ventral face without or with reduced microsculpture (only one female examined with indistinct microsculpture consisting of isodiametric to slightly elongate meshes present on parts of mentum). Labial palpi slender, not elongate.

Thorax: Pronotum dark brown to black with indistinctly brighter, narrow lateral margins. Pronotal punctures slightly finer than on head, with slightly larger interspaces. Prosternum with very short, flat, median carina in anterior third. Elytra unicolored dark brown to almost black. Setae absent from lateral borders of pronotum and elytra. Callosity on shoulder region absent. Anterior elytral declivity distinct. Punctures on elytra moderately fine, as fine as on pronotum or very slightly coarser. Punctures equally sized and with equal interspaces, with denser distribution

than on pronotum; largely irregular, with vague tendency to form rows on elytral disc. Microsculpture absent. Mesoventrite with a distinct median protuberance, consisting of a blunt triangular tooth. Procoxae without spine-like setae. Legs dark brown, slightly brighter than ventrites; profemur pubescent on proximal 3/4, mesofemur on proximal 2/3 of ventral face, metafemoral pubescence reduced to a narrow stripe at anterior margin and proximal portion. Metatarsus distinctly shorter than metatibia.

Aedeagus (Fig. 7): Phallobase distinctly shorter than parameres, slightly longer than wide, manubrium with a long spine-like extension. Ventral face of phallobase with ventral excision reaching spine-like extension of manubrium. Parameres with very slightly curved lateral margins, widest at base, narrowing towards subapical portion, apices broadly rounded, asymmetrical, with soft, very weakly pigmented extension pointing mediad. Ventral bases of parameres fused. Median lobe moderately wide at base, continuously narrowing apicad, with pointed apex. Median lobe shorter than parameres, corona in subapical position, basal apophyses about half as long as main piece, with distinct, short extension into phallobase, very slightly pointing mesad. Base of median lobe mesally indistinctly connected with parameres.

DIFFERENTIAL DIAGNOSIS: *Anacaena rara* differs from *A. wewalkai* mainly in the smaller preocular patches on the clypeus, darker coloration of pronotum, presence of a prosternal carina; by irregular, equidistant, equally strong elytral punctures, and by the aedeagus.

HABITAT: This species was found in dense mats of aquatic plants in a very slowly flowing stream, about one meter deep, with turbid water, boggy bottom, sandy and loamy banks, together with various other hydrophilids and dytiscids (*Exocelina* spp., *Hydrovatus opacus* SHARP).

DISTRIBUTION (Fig. 11): Known only from the type locality.

ETYMOLOGY: The name of the epithet refers to the small number of specimens which could be collected.

Anacaena silvatica sp.n.

TYPE LOCALITY: New Caledonia, North Province, Hienghène, Roche d'Ouaieme.

TYPE MATERIAL: **Holotype** ♂ (NMW): "Roche d'Ouaieme / b.Hyneghene [= Hienghène], Neu- / Kaledonien, lg. Franz".

Paratypes: NORTH PROVINCE: 5 exs. (NMW): same locality data as holotype; 2 exs. (MHNG): Tao Waterfalls near Panié, litter, 9.XI.1997, leg. I. Löbl; 6 exs. (NZAC, NMW): Mt. Panié, 600 m, sifted leaf litter, 28.X.1978, leg. J.C. Watt "78/263"; 8 exs. (NZAC, NMW): Mt. Panié, 350 m, sifted litter and rotten wood, 28.X.1978, leg. J.C. Watt "78/262"; 7 exs. (NZAC, NMW): Mt. Panié, 250 m, sifted leaf litter and rotten wood, 29.X.1978, leg. G. Kuschel "78/264"; 1 ♂ (MNHW): Aoupinié, gate meteo st., 900-950 m a.s.l., 21°11'S/165°17'E, 8.II.2004, leg. M. Wanat.

SOUTH PROVINCE: 1 ♀ (MNHW): Forêt Nord (botanical reserve), 200 m a.s.l., 22°19'S/166°55'E, humid forest, 16.II.2004, leg. M. Wanat; 6 exs. (MHNG): Rivière Bleue (provincial park), primary forest, litter, 20.X.1998, leg. I. Löbl.

DESCRIPTION: Total length 2.3–2.7 mm, total width 1.3–1.4 mm, EI 1.1–1.2. Habitus: distinctly convex dorsally, ovoid, rather wide, not attenuate apically.

Head (Fig. 3): Clypeus rufous without preocular patches, frons darker brown than clypeus. Punctures on clypeus and frons moderately fine, moderately widely separated, spaces 2–3 × as wide as one puncture. Microsculpture absent. Clypeus short with very blunt anterolateral angles, anterior edge straight. Eyes slightly emarginate anteriorly, slightly reniform. Antenna composed of eight antennomeres. Maxillary palpus moderately slender, palpomere 2 weakly inflated, palpomere 4 without infuscation. Mentum flat with slightly convex lateral margins, densely

fringed with fine setae, very slightly impressed anteriorly, anterior edge not emarginate. Labial palpi slender, not elongate.

Thorax: Pronotum unicolored rufous. Pronotal punctures finer than on head, interspaces wider. Prosternum with very short median carina in anterior third. Elytra unicolored rufous. Setae absent from lateral borders of pronotum and elytra. Callosity on shoulder region absent. Anterior elytral declivity distinct. Sutural stria in posterior 2/3–3/4 of elytra in dorsal view. Punctures on elytra fine as on pronotum, equidistant, rather widely spaced, equally strong, largely irregular, mainly on anterior portion of elytra. Some punctures serially arranged, becoming more distinctly serial laterad and apicad; alternating pattern of primary and secondary rows absent. Microsculpture absent. Mesoventrite with distinct median protuberance, mainly consisting of a semilunar horizontal ridge. Procoxae without spine-like setae. Legs dark brown, on some parts brighter than ventrites; pro- and mesofemur ventrally almost entirely covered with hydrofuge pubescence, metafemoral pubescence reduced to a narrow stripe at anterior margin and to proximal portion. Femora and tibiae very wide. Metatarsus distinctly shorter than metatibia.

Aedeagus (Fig. 8): Main piece of phallobase much less than half as long as parameres, slightly wider than long, Manubrium abruptly narrowing, terminating in a spine-like extension. Ventral face of phallobase with ventral excision reaching spine-like extension. Parameres very slender, with slightly curving lateral margins, widest at base, narrowing towards midlength, slightly widening from midlength to apex. Apices broadly rounded, slightly asymmetrical. Ventral bases of parameres fused. Median lobe moderately wide at base, continuously narrowing apicad, with pointed apex. Median lobe distinctly shorter than parameres, corona in subapical to apical position, basal apophyses more than twice as long as main piece of median lobe, with distinct, short extension into phallobase. Base of median lobe mesally visibly connected with parameres by a distinct tooth.

DIFFERENTIAL DIAGNOSIS: *Anacaena silvatica* differs from other species of *Anacaena* from New Caledonia by the wide and short clypeus, the absence of preocular patches, the unicolored pronotum and elytra, the unusual wide and stout femora and tibiae, and the aedeagus.

HABITAT: This species occurs together with *A. violacea* at the type locality of the latter. Both species were collected in the litter of primary forest. *Anacaena silvatica* may therefore be considered terrestrial.

DISTRIBUTION (Fig. 12): Known only from northeastern Grande Terre.

ETYMOLOGY: The name of the epithet refers to the assumed terrestrial habitat of the species.

Anacaena violacea (GENTILI, 1996)

Paranacaena violacea GENTILI 1996: 186.

TYPE LOCALITY: New Caledonia, South Province, Rivière Bleue Provincial Park.

TYPE MATERIAL EXAMINED: **Holotype** ♂ (AMNY): “NEW CALEDONIA: Rivière / Bleue, 280m, Berlese, litter / montane forest, May 21.1987 / N.I. Platnick, R.J. Raven \ ♂ Holotypus / *Paranacaena violacea* n. sp. / E. Gentili 1995 \ [aedeagus mounted separately on a transparent card]”.

Paratypes: 2 ♀ ♀ (AMNY, MSNV): same locality data.

ADDITIONAL MATERIAL EXAMINED:

NORTH PROVINCE: 3 ♀ ♀ (MNHV): Mandjélie (summit), 750–780 m a.s.l., 20°23.9'S/164°31.9'E, sifting rain forest litter, 11.I.2007, leg. M. Wanat; 1 ex. (MHNG): Col des Roussettes, ravine, forest litter 25.X.1998, leg. I. Löbl; 1 ex. (MHNG): Col des Roussettes, litter in ravine, 12.IX.1998, leg. I. Löbl.

SOUTH PROVINCE: 9 ♂ ♂, 3 ♀ ♀ (MNHV): Col d'Amieu, 6.5–7.0 km from gate, 450–470 m a.s.l., 21°35.2'S/165°46.4'E, night collecting, 5.I.2007, leg. M. Wanat & R. Dobosz; 1 ex. (MHNG): Mt. Koghi, 400–500 m,

primary forest, litter, 18.–19.X.1998, leg. I. Löbl; 11 exs. (MHNG, NMW): Mt. Koghi, 500–600 m, primary forest, litter, 14.XI.1997, leg. I. Löbl; 1 ♀ (NMW): Mt. Koghi, 530 m, forest litter, 5.XII.2009, leg. R. Schuh; 1 ex. (MHNG): Col de Mouirange, 260 m, litter, 16.XI.1997, leg. I. Löbl; 1 ♀ (MNHW): Forêt Nord (botanical reserve), 200 m a.s.l., 22°19'S/166°55'E, humid forest, 16.II.2004, leg. M. Wanat; 1 ex. (MHNG): Rivière Bleue (provincial park), primary forest, litter, 20.X.1998, leg. I. Löbl.

DESCRIPTION: Total length 1.8–1.9 mm, total width 1.2 mm, EI 1.04–1.14. Habitus: distinctly convex, rather wide dorsally, almost parallel-sided for a very short distance in midlength, not attenuate apicad, apex broadly rounded.

Head (Fig. 4): Clypeus very dark rufous, variably brighter laterally, frons black. Punctures on clypeus and frons very fine, widely separated, spaces 4–5 × as wide as one puncture. Microsculpture absent. Clypeus short, without discernible anterolateral angles, anterior edge straight. Eyes very slightly emarginate anteriorly. Antenna composed of eight antennomeres. Maxillary palpus moderately slender, palpomere 2 weakly inflated, palpomere 4 without infuscation. Mentum flat with straight lateral margins, very slightly impressed anteriorly, anterior edge not emarginate. Labial palpi slender, not elongate.

Thorax: Pronotum black with indistinctly demarcated brighter, narrow, lateral margins. Pronotal punctures very fine to obsolete. Prosternum with very short median carina in anterior third. Elytra dark brown to black, sometimes with very indistinctly demarcated brighter areas laterally and apically. Minute setae on lateral borders of elytra, mainly apically. Distinct callosity on shoulder region absent. Anterior elytral declivity narrow. Sutural stria in posterior 2/3 of elytra in dorsal view. Punctures on elytra moderately fine, equidistant; spaces on average 2–3 × as wide as one puncture. Punctures serial, rows of more densely arranged punctures alternating with rows of punctures with slightly larger interspaces; indistinct, short rows of slightly coarser punctures near lateral margins. Microsculpture absent. Mesoventrite with distinct median protuberance, mainly consisting of a semilunar horizontal ridge. Procoxae without spine-like setae. Legs dark brown, slightly brighter than ventrites. Pro- and mesofemur ventrally almost entirely covered with hydrofuge pubescence, metafemoral pubescence reduced to a narrow stripe at anterior margin and to proximal portion. Metatarsus slightly shorter than metatibia.

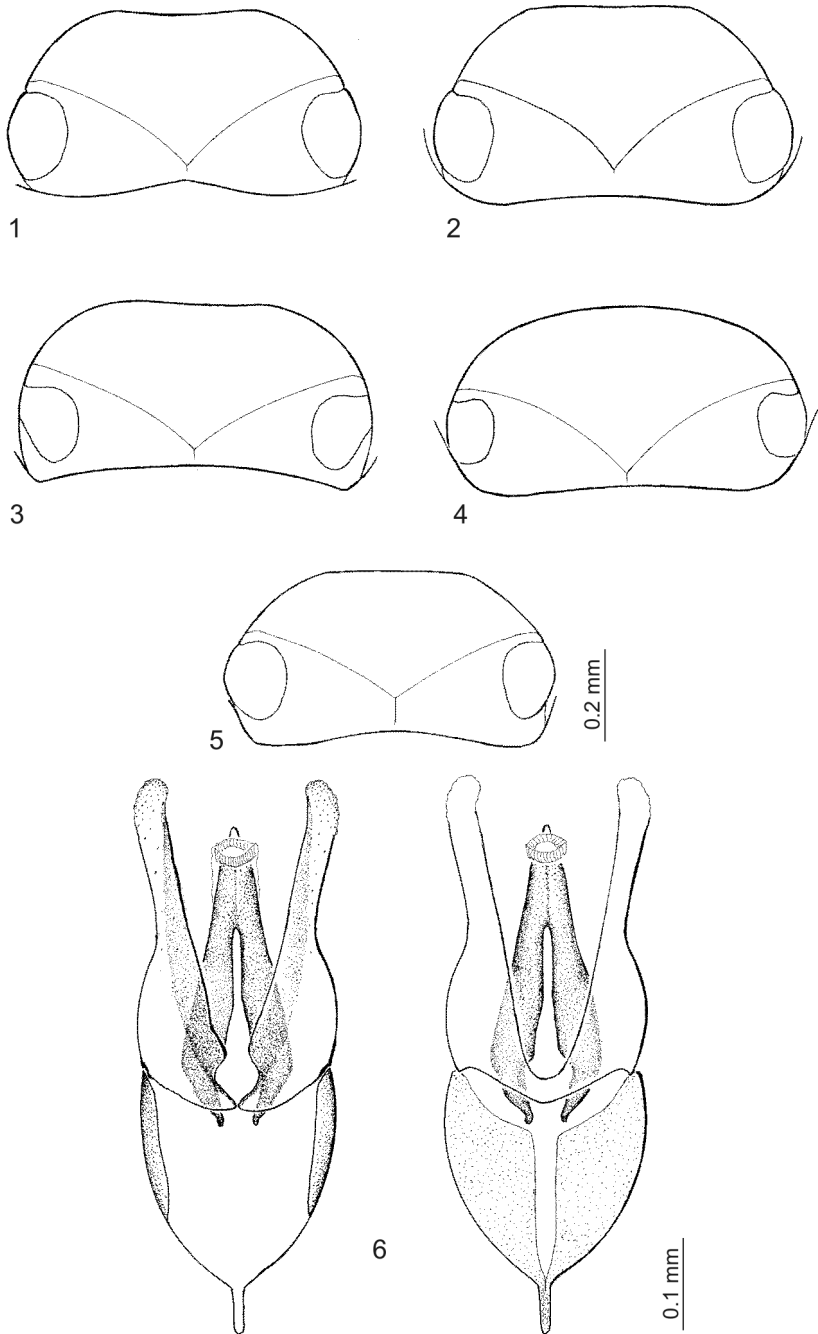
Aedeagus (Fig. 9): Phallobase more than half as long as parameres, about as wide as long, proximal portion of manubrium abruptly narrowing; manubrium with spine-like extension. Parameres with slightly sigmoidal lateral margins, widest at base, narrowing towards midlength, very slightly widening from midlength to apex. Apices broadly rounded. Ventral bases of parameres fused, deeply extending into phallobase. Median lobe moderately wide at base, continuously narrowing apicad, with elongate apex. Median lobe slightly shorter than parameres. Corona in subapical position. Basal apophyses more than half as long as main piece of median lobe, with distinct extension into phallobase. Base of median lobe mesally visibly connected with parameres by a small tooth.

DIFFERENTIAL DIAGNOSIS: *Anacaena violacea* differs from the remaining New Caledonian species by the combination of the following features: dorsal surface dark brown to black, with very indistinctly brighter margins; pronotum very finely punctate; punctures on elytra distinctly coarser, with clear serial distribution; elytral apex setiferous; shape of aedeagus.

DISCUSSION: In contrast to the original description, the ventral face of the epipleura is densely pubescent, a “relief” as described by GENTILI (1996) is not present, the hydrofuge pubescence on the ventral face of the metafemora is reduced to the anterior margin and to a very small proximal area; the remaining part of the metafemur is only set with few fine long setae.

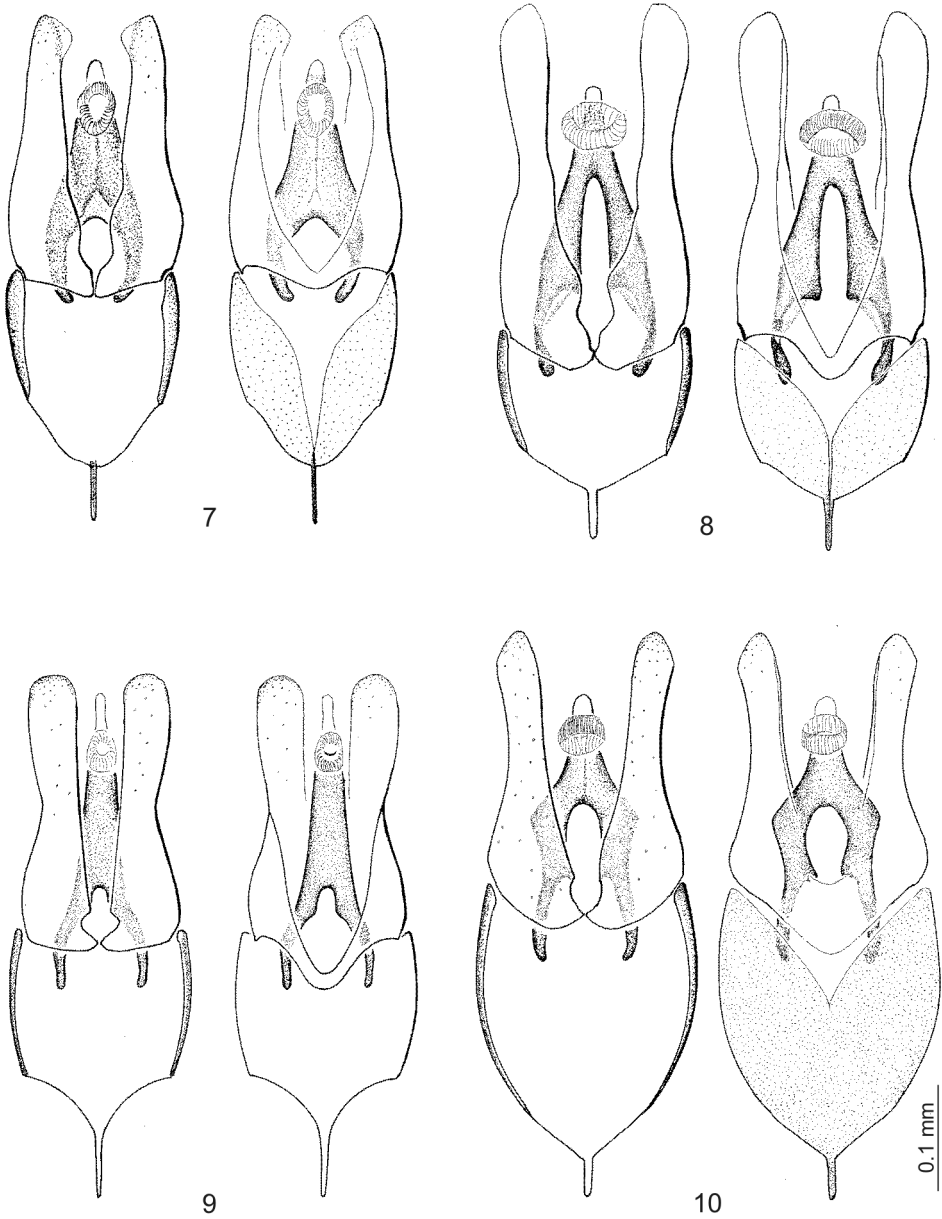
HABITAT: *Anacaena violacea* is found in forest litter and may therefore be considered as a terrestrial species.

DISTRIBUTION (Fig. 11): Rather wide-spread on Grande Terre.

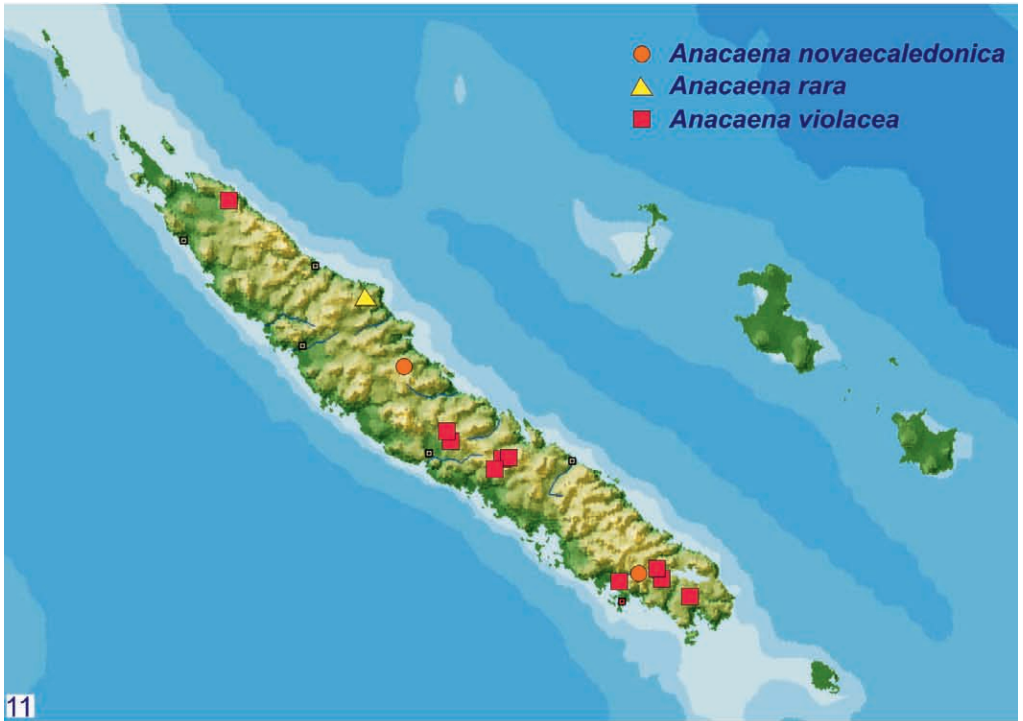


Figs. 1–5: Caput in dorsal view, 1) *Anacaena novacaledonica*, 2) *A. rara*, 3) *A. silvatica*, 4) *A. violacea*, 5) *A. wewalkai*.

Fig. 6: Aedeagus of *Anacaena novacaledonica* in dorsal (left figure) and ventral (right figure) view.



Figs. 7–10: Aedeagus in dorsal (left figure) and ventral (right figure) view, 7) *Anacaena rara*, 8) *A. silvatica*, 9) *A. violacea*, 10) *A. wewalkai*.



Figs. 11–12: Geographical distribution of the species of *Anacaena* in New Caledonia.

Anacaena wewalkai sp.n.

TYPE LOCALITY: New Caledonia, North Province, Aoupinié, 15 km SW Ponérihouen, ca. 500–700 m a.s.l. (Loc. 2001/NC 33).

TYPE MATERIAL: **Holotype** ♂ (NMW): “New Caled.: North Prov. / 15 km SW Ponérihouen / Aoupinié, 500 – 700 m, / 14. 11. 2001 / leg. Balke & Wewalka (NC 33)”.

Paratypes: NORTH PROVINCE: 20 exs. (NMW): same locality data as holotype.

1 ex. (NMW): Loc. 2001/NC 36; 1 ex. (NMW): Loc. 2001/NC 37; 11 exs. (NMW): Loc. 2001/NC 39.

1 ♂, 1 ♀ (NMW): Loc. 2009/NC 30.

SOUTH PROVINCE: 1 ex. (IAC): Sarraméa, Col d’Amieu, 21.63411°S/165.89527°E, 465 m a.s.l., “par battage”, 2.II.2006, leg. C. Mille & J.-P. Kataoui.

1 ex. (NMW): Loc. 2001/NC 3; 1 ex. (NMW): Loc. 2001/NC 5; 4 exs. (NMW): Loc. 2001/NC 40; 3 exs. (NMW): Loc. 2001/NC 41; 2 exs. (NMW): Loc. 2001/NC 43.

1 ♀ (NMW): Loc. 2009/NC 3; 6 ♂♂ (NMW): Loc. 2009/NC 9; 3 ♂♂, 4 ♀♀ (NMW): Loc. 2009/NC 11; 8 ♂♂, 7 ♀♀ (NMW): Loc. 2009/NC 14; 4 ♂♂, 1 ♀ (NMW): Loc. 2009/NC 16; 2 ♂♂, 1 ♀ (NMW): Loc. 2009/NC 18; 2 ♂♂, 1 ♀ (NMW): Loc. 2009/NC 22.

DESCRIPTION: Total length 2.1–2.5 mm, total width 1.2–1.4 mm, EI 1.25. Habitus: distinctly convex dorsally, rather narrow, not attenuate apically.

Head (Fig. 5): Clypeus and frons dark brown, with large yellowish brown preocular patches, in some species confluent mesally or antero-mesally. Punctures on clypeus and frons moderately fine; densely and irregularly distributed, interspaces 1–3 × as wide as a puncture. Microsculpture absent. Clypeus moderately short with blunt anterolateral angles, anterior edge straight. Eyes very slightly emarginate anteriorly. Antenna composed of eight antennomeres. Maxillary palpus moderately slender, palpomere 2 weakly inflated, palpomere 4 without infuscation. Mentum flat with straight lateral margins, very slightly impressed anteriorly, anterior edge not emarginate. Ventral surface with distinct microsculpture, represented by isodiametric to slightly elongate meshes. Labial palpi moderately stout.

Thorax: Pronotum light brown with small, variably sized central dark brown patch. Pronotal punctures fine, distinctly finer than on head. Prosternum with a short, acute extension antero-mesally, roof-shaped in anterior third, carina absent. Elytra dark brown, unicolorous in most individuals, lateral margins in some individuals with lighter brown coloration. Setae absent from lateral borders of pronotum and elytra. Callosity on shoulder region indistinct, anterior elytral declivity distinct. Punctures on elytra coarser than on pronotum, varying from very fine to moderately sized; rows of subserial punctures on some areas alternating with irregular punctures. Serial punctures rather equally spaced within one row; distances between punctures of a series smaller than distances between punctures of different rows. Microsculpture absent. Mesoventrite with a distinct median protuberance, consisting of a blunt triangular tooth. Procoxae without spine-like setae. Legs dark brown; pro- and mesofemora ventrally almost entirely covered with hydrofuge pubescence; metafemoral pubescence reduced to a narrow stripe at anterior margin and to proximal portion. Metatarsus distinctly shorter than metatibia.

Aedeagus (Fig. 10): Main piece of phallobase about as long as parameres, slightly longer than wide. Proximal portion of manubrium smoothly narrowing proximad; manubrium with spine-like extension. Ventral face of phallobase with excision reaching middle of phallobase. Parameres with slightly curved lateral margins, widest at base, narrowing towards midlength, almost parallel-sided from midlength to apex. Apices broadly rounded, slightly asymmetrical, tissue of apex softer than main piece of parameres. Median lobe very wide at base, distinctly narrowing apicad, with rather pointed apex; distinctly shorter than parameres. Corona in subapical position. Basal apophyses long, longer than main piece of median lobe, distinctly extending into phallobase. Median lobe mesally visibly connected with parameres by a large tooth-like extension.

DIFFERENTIAL DIAGNOSIS: *Anacaena wewalkai* differs from all other New Caledonian species of *Anacaena* by the light brown pronotum with small dark brown central patch, and by the shape of the aedeagus.

HABITAT: This species was found in gravel, roots, and foliage in stagnant pools or slowly flowing streams, in very clear to slightly muddy water. *Anacaena wewalkai* shares the type locality with *A. novacaledonica*.

DISTRIBUTION (Fig. 12): Rather wide-spread on Grande Terre.

ETYMOLOGY: This species is dedicated to the Austrian water beetle specialist Günther Wewalka.

Discussion

A surprising result of the present study is the relatively high number of species of *Anacaena* found in New Caledonia (eight species are for instance known from Australia). All five New Caledonian species are endemic to Grande Terre, no specimen has so far been recorded from any other New Caledonian island.

All these species seem to be phylogenetically closely related. They share certain morphological characters with species from New Guinea and Australia (e.g. a distinct protuberance on the mesoventrite; a reduced metafemoral pubescence; a spine-like extension of the manubrium). These characters suggest a clade comprising the species from New Caledonia together with some species from New Guinea and Australia. A common origin of these species in the Australian Region can be assumed, even though some of the shared morphological features do also occur in other species of *Anacaena*.

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