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Taxonomic revision of *Anacaena* THOMSON, 1859
IV. Australia
(Coleoptera: Hydrophilidae)

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Abstract

The species of *Anacaena* THOMSON, 1859 (Coleoptera: Hydrophilidae) from Australia are revised taxonomically. All species hitherto assigned to *Paranacaena* BLACKBURN, 1889 are transferred to *Anacaena*. One new species, *Anacaena eremitoides* sp.n., is described. Two new synonymies are established: *Paranacaena tasmaniana* GENTILI, 2002 = *Anacaena sublineata* (BLACKBURN, 1889), and *Paranacaena hibrida* GENTILI, 2002 = *Anacaena littoralis* d'ORCHYMONT, 1942.

Key words: Coleoptera, Hydrophilidae, *Anacaena*, *Paranacaena*, taxonomy, revision, Australia.

Introduction

The species of *Anacaena* THOMSON, 1859 from the Australian Region have changed their generic assignment several times: BLACKBURN (1889) regarded them as *Paracymus* THOMSON, 1867 and erected the subgenus *Paranacaena*. KNISCH (1924) elevated *Paranacaena* to generic rank. D'ORCHYMONT (1942) transferred them to *Anacaena*, GENTILI (1993, 1996, 2002) again to *Paranacaena*. HEBAUER (2003) established the monotypic genus *Gentilina* HEBAUER, 2003. In a recent phylogenetic study (KOMAREK & BEUTEL 2006) *Paranacaena* and *Gentilina* were synonymized with *Anacaena.* Following this study, the species treated herein are transferred formally to *Anacaena.*

In the present contribution all species currently known are revised and keyed. One new species is described.

Material and methods

Type specimens of all species and about 600 additional specimens of *Anacaena* collected in Australia were examined. They are deposited in thirteen different collections. Mouthparts, thoracic structures and 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 (Leica MZ 12.5) with diffuse and focussed light sources. Measurements were taken using a micrometric eyepiece. Ink drawings were made with a drawing tube. Many label data are cited literally: " / " indicates a new line, " \ " a new label.

Morphological remarks

The morphological terminology is based on KOMAREK (2004). Some additional morphological features relevant to species from the Australian Region are explained below. The protuberance on the mesoventrite is very similar in all species with the exception of *A. nitens* (GENTILI, 1993),

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and very similar to the protuberance in the Holarctic *A. lutescens* (STEPHENS, 1829). It is formed by a very short, flat carina meeting an approximately semilunar transverse ridge. All abdominal ventrites are completely covered with hydrofuge pubescence. The first ventrite is always lacking a carina, ventrite 5 lacks an apical excision. The median lobe consists of a pair of basal apophyses and a "main piece". In most species, a deep median incision indicates the border between the distal "main piece" and the proximal apophyses. The length ratio of these two parts of the aedeagus is an important feature for distinguishing species. In some species the mesal margin of the basal apophysis is extended into a more or less large "tooth" connecting the median lobe with the parameres.

The following peculiar morphological features are present in many species of the Australian Region, and were used by GENTILI (1993) for establishing *Paranacaena*: 1) serial elytral punctation, in some species arranged in two alternating rows: a "primary" row of coarser punctures, strictly serial, with almost equal, comparatively large distances, and a "secondary" row of 2–3 times as many punctures, subserially arranged, finer, and with much shorter distances (Figs. 20, 21). 2) manubrium distinctly demarcated from the main piece of the phallobase and extended into a narrow basal spine.

The term "main piece of the phallobase" refers to the structure with distinctly inflected lateral margins (Figs. 6, 8, 10, 12, 14, 16) which are absent from the manubrium. The manubrium usually comprises a wider, distal portion and a narrow (often spine-like) proximal portion. The ventral face of the phallobase is distinctly excised in most species. The shape of this incision is a very constant specific feature. In *Anacaena* and many other genera of Hydrophilidae the anterior elytral base is more or less strongly overlapped by the posterior pronotal margin. It is distinctly delimited in some species, serving as a diagnostic feature, and referred to as "basal furrow" by GENTILI (1993). As it is rather an area with an even surface than a furrow it is denoted "anterior elytral declivity" in the present contribution.

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Abbreviations

Collections

AEZS	A.E.Z. Short Collection, Ithaca (New York, U.S.A.)
ANIC	Australian National Insect Collection CSIRO, Canberra (Australia)
CFH	Collection of Franz Hebauer, Plattling (Germany)
CLH	Collection of Lars Hendrich, München (Germany)
CMB	Collection of Michael Balke, München (Germany)
FMNH	Field Museum of Natural History, Chicago (USA)
MCZ	Museum of Comparative Zoology, Cambridge, Massachusetts (USA)
MSNG	Museo Civico di Storia Naturale G. Doria, Genova (Italy)
MSNV	Museo Civico di Storia Naturale, Verona (Italy)
NHM	Natural History Museum, London (U.K.)
NMW	Naturhistorisches Museum Wien (Austria)

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SAMA	South Australian Museum, Adelaide (Australia)
ZMUC	Zoological Museum Copenhagen (Denmark)

Morphology

CI	clypeal index = ratio of largest clypeal width to clypeal length anterior to eyes (Fig. 19)
EI	elytral index = ratio of greatest elytral length to greatest elytral width
OI	ocular index = ratio of smallest distance between eyes to diameter of eye

Australian states

ACT	Australian Capital Territory	SA	South Australia
NSW	New South Wales	T	Tasmania
NT	Northern Territory	V	Victoria
Q	Queensland	WA	Western Australia

Checklist of species of *Anacaena* from Australia

1. *Anacaena eremita* (BLACKBURN, 1896)	NT, Q
2. *Anacaena eremitoides* sp.n.	NSW, Q
3. *Anacaena horni* (BLACKBURN, 1896)	ACT, NSW, NT, Q, SA, T, V, WA
4. *Anacaena lindi* (BLACKBURN, 1889)	ACT, NSW, Q, SA, V, WA
5. *Anacaena littoralis* d'ORCHYMONT, 1942	ACT, NSW, V, WA
6. *Anacaena nitens* (GENTILI, 1993)	Q
7. *Anacaena sublineata* (BLACKBURN, 1889)	NSW, SA, T, V
8. *Anacaena wattsi* (GENTILI, 1993)	NSW, NT, Q, T, WA

Anacaena eremita (BLACKBURN, 1896)

Paracymus (*Paranacaena*) *eremita* BLACKBURN 1896: 257.
Paranacaena eremita: KNISCH 1924: 168; GENTILI 1993: 290.
Anacaena (*Paranacaena*) *eremita*: d'ORCHYMONT 1942: 37 (footnote).

TYPE LOCALITY: Australia, Northern Territory, Paisley Bluff.

TYPE MATERIAL EXAMINED: **Lectotype** ♂ (NHM): "5482 / Paisl. / Bl. [handwritten] \ Type [round card] \ Australia / Blackburn Coll. / B.M.1910-236 \ *Paracymus eremita*, Blackb. [handwritten] \ ♂ Lectotypus / E. Gentili 1992 / *Paranacaena* / *eremita* Blackb. [handwritten] \ [aedeagus mounted separately on a transparent card]". BLACKBURN (1896) mentions two specimens. The second specimen could not be found in the NHM collection.

ADDITIONAL MATERIAL EXAMINED:

AUSTRALIA: NT: 15 exs. (MSNV, NMW, SAMA): Standley Chasm, small semi-permanent stony creek, heavily shaded, with dead leaves and some algae, IV.1968 [not "1986" as in GENTILI (1993)], C. Watts; 8 exs. (MSNV, NMW, SAMA): 30 miles W Alice Springs, pool in bed of large sandy creek with dead leaves, IV.1968, C. Watts; **Q:** 1 ♂ (SAMA): Cunningham's Gap, 24.III.1968, C. Watts.

DESCRIPTION: Total length 2.2–3.0 mm, maximum width 1.3–1.7 mm, EI 1.06–1.26. Habitus (Fig. 1): distinctly convex dorsally, moderately broad, widest at midlength, very slightly attenuate apically. Elytral margins completely visible in dorsal view.

Head: Clypeus and frons dark brown, with rather small yellow preocular patches. Punctures on clypeus and frons moderately coarse, densely distributed, with unequal distances, interspaces 1–2 x as wide as one puncture. Microsculpture absent. Clypeus about as long as diameter of eye with blunt anterolateral angles and straight anterior margin, CI=4.0. Eyes very weakly constricted by anterior clypeal extension, OI=3.9. Antenna composed of eight antennomeres.

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Maxillary palpus moderately slender; palpomere 2 weakly inflated, palpomere 4 with apical infuscation. Mentum sexually dimorphic: ventral face with a deep longitudinal median impression in males, with a shallow median impression in females. Lateral margins of mentum straight; anterior margin distinctly projecting; ventral face with widely spaced fine setiferous punctures; chagrination present. Labial palpi slender, shorter than lateral edge of mentum.

Thorax: Pronotum dark brown; intensity of coloration slightly decreasing towards lateral margins. Pronotal punctures fine, irregularly and moderately densely distributed; interspaces 1–3 x as wide as one puncture. Prosternum without distinct carina, with a knob-like extension on anterior third. Elytra dark brown, coloration slightly brighter towards lateral margins. Setae absent from lateral borders of pronotum and elytra. Callosity on shoulder regions absent. Anterior elytral declivity distinct. Sutural stria recognisable on posterior 0.7 of elytra in dorsal view. Punctures on elytra (Fig. 20) serially arranged; primary and secondary rows present; punctures of secondary row as strong as punctures on frons. Mesoventrite with distinct protuberance. Procoxae without spine-like setae. Legs and ventrites dark brown. Pro- and mesofemur ventrally almost entirely covered with hydrofuge pubescence; metafemoral pubescence restricted to anterior margin and proximal portion. Metatarsus distinctly shorter than metatibia.

Aedeagus (Figs. 6, 7): Main piece of phallobase slightly shorter than parameres, slightly wider than long, abruptly narrowing towards manubrium; spine-like extension of manubrium present. Parameres with wide base, distinctly curved in basal half, narrowing towards almost parallel-sided apical third; apex nearly cylindrical and weakly sclerotized. Median lobe widest at base, evenly narrowing towards pointed apex. Median lobe shorter than parameres, with corona in apical position; basal apophyses very long, longer than main piece of median lobe, with distinct extension into phallobase. Base of median lobe visibly connected with parameres.

DIFFERENTIAL DIAGNOSIS: This species is very similar to *A. eremitoides* (see below). From all other dark brown to black species from Australia, *A. eremita* can be distinguished by the arrangement of the elytral punctures (Fig. 20).

BIONOMICS: This species was found in a small semi-permanent stony creek and in a pool in the bed of a large sandy creek, among algae and dead leaves.

DISCUSSION: The punctures on the head are fine and dense (not scarce as noted by GENTILI 1993); GENTILI's (1993) observation "prosternal midline posteriorly protruding as a thorn" cannot be confirmed. GENTILI (1993) notes that the mesoventrite lacks a tooth; however, a distinct protuberance similar to that of most species described herein is present.

DISTRIBUTION: Australia (NT, Q).

Anacaena eremitoides sp.n.

TYPE LOCALITY: Australia, Queensland, Cunningham's Gap; fast running, clear, small creek, in still rock pools (personal communication by C. Watts).

TYPE MATERIAL: **Holotype** ♂ (SAMA): "Qld. Cunninghams / Gap 24.11.95 C.Watts \ SAMA Database No / 25-00 8724". **Paratypes: Q:** 5 exs. (NMW, SAMA): same data; 15 exs. (NMW, SAMA): 5 km W Mossman, Mossman Gorge, 20.VIII.2006, C. Watts; 1 ex. (MSNV): ca. 9 km W of Paluma, 4.–13.XII.1973, at light, J.G. Brooks; **NSW:** 1 ♂ (SAMA): Cabbage Tree Creek, Nelligan 20 km W, fairly wide, clean, wadeable river, gravel substrate, vegetation present at banks and in recently flooded areas, 30.XI.95, C. Watts; 1 ♂ (SAMA): Salisbury, clean mountain creek, forming rock pools, covered by tree canopy, 26.XI.95, C. Watts.

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DESCRIPTION: Total length 2.2–2.5 mm, maximum width 1.4 mm, EI 1.18–1.31. Habitus: distinctly convex dorsally, moderately broad, widest at midlength, very slightly attenuate apically. Elytral margins not completely visible in dorsal view.

Head: Clypeus and frons dark brown, with moderately large yellow preocular patches. Punctures on clypeus and frons fine, rather widely spaced with unequal distances, interspaces 1–3 x as wide as one puncture. Microsculpture absent. Clypeus about as long as diameter of eye, with blunt anterolateral angles and straight anterior margin, CI=4.5. Eyes very weakly constricted by anterior clypeal extension, OI=3.6. Antennae composed of eight antennomeres. Maxillary palpus moderately slender, palpomere 2 weakly inflated, palpomere 4 with weak apical infuscation, or infuscation absent. Mentum flat with distinctly separated setiferous punctures, microstructure absent. Labial palpi slender, as long as lateral edge of mentum. Prosternum without distinct carina, with a weak knob-like extension on anterior third.

Thorax: Pronotum dark brown, with lighter brown coloration along lateral margins. Pronotal punctures fine, as on head, unequally and moderately densely distributed, interspaces 2–4 x as wide as one puncture. Elytra dark brown, with distinctly brighter brown coloration along lateral margins. Setae absent from lateral borders of pronotum and elytra. Callosity on shoulder regions absent. Anterior elytral declivity indistinct. Sutural stria recognisable in posterior 0.7 of elytra in dorsal view. Primary and secondary rows of elytral punctures present. Punctures of primary rows about as strong as punctures on frons and pronotum. Mesoventrite with distinct median protuberance. Procoxae without spine-like setae. Legs and ventrites as dark as elytra. Pro- and mesofemur almost entirely covered with hydrofuge pubescence ventrally. Metafemoral pubescence restricted to anterior margin and proximal portion. Metatarsus distinctly shorter than metatibia.

Aedeagus (Figs. 8–9): Main piece of phallobase slightly shorter than parameres, slightly wider than long, abruptly narrowing towards manubrium. Manubrium distinctly demarcated with spine-like extension. Parameres distinctly curved in basal half, wide at base, narrowing towards almost parallel-sided apical third; apex nearly cylindrical, weakly sclerotized. Median lobe widest at base, evenly narrowing towards pointed apex. Median lobe shorter than parameres, with corona in apical position, basal apophyses very long, longer than main piece of median lobe, with distinct extension into phallobase. Base of median lobe visibly connected with parameres.

DIFFERENTIAL DIAGNOSIS: This species is very similar to *A. eremita*, including the aedeagus. It can be distinguished from the latter mainly by the following morphological features: mentum shiny, with distinctly impressed setiferous punctures, chagrination absent; ventral face of mentum flat, depression absent; lateral margins of elytra slightly inflected ventrad, thus partly visible in ventral view; base of parameres slightly narrower (differences in the shape of the aedeagus very subtle, direct comparison with aedeagus of *A. eremita* recommended). From all other dark brown to black species from Australia, *A. eremitoides* can be distinguished by the presence of primary and secondary rows of elytral punctures.

BIONOMICS: This species occurs in pools and among vegetation at the banks of mountain creeks. It was also collected at artificial light sources.

DISCUSSION: The separate specific status is justified by the mentum which is distinctly different from *A. eremita*, and by different aedeagal characteristics.

DISTRIBUTION: Australia (NSW, Q).

ETYMOLOGY: The name of the epithet refers to the similarity with *A. eremita.*

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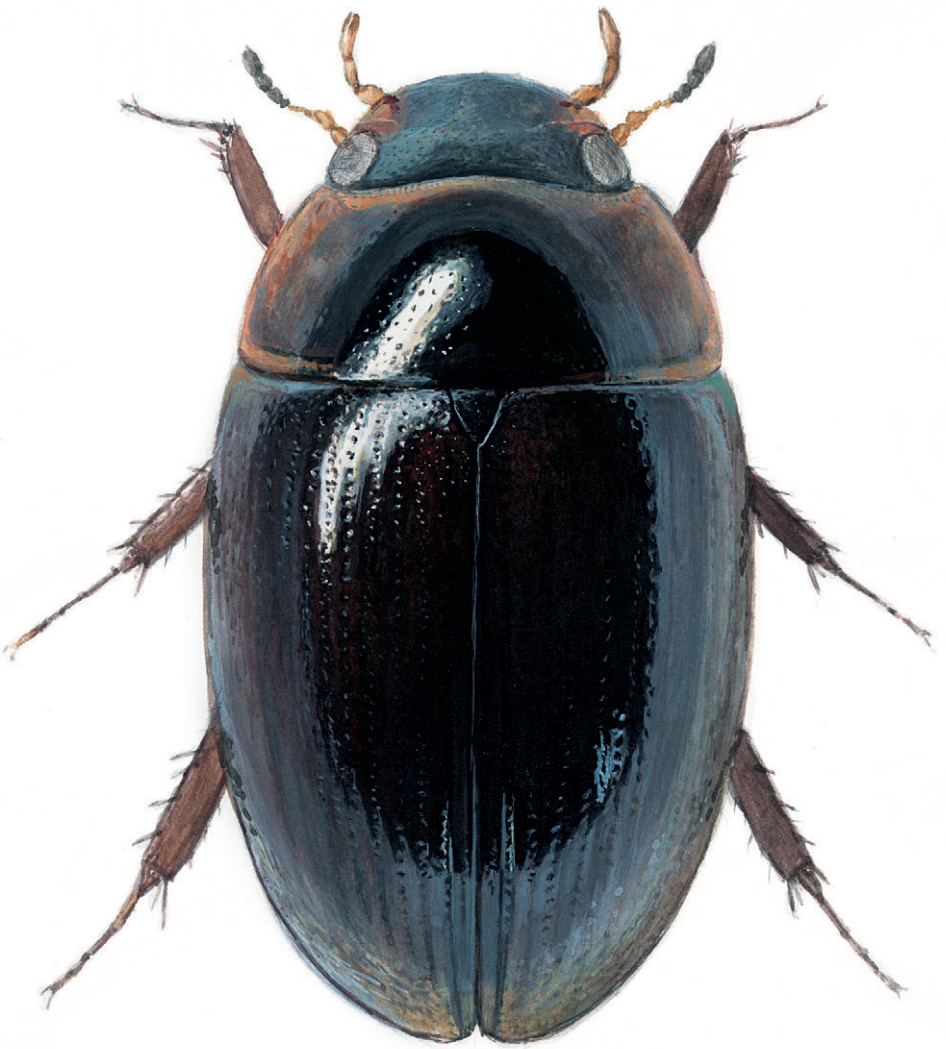

Fig. 1: Habitus of *Anacaena eremita.*

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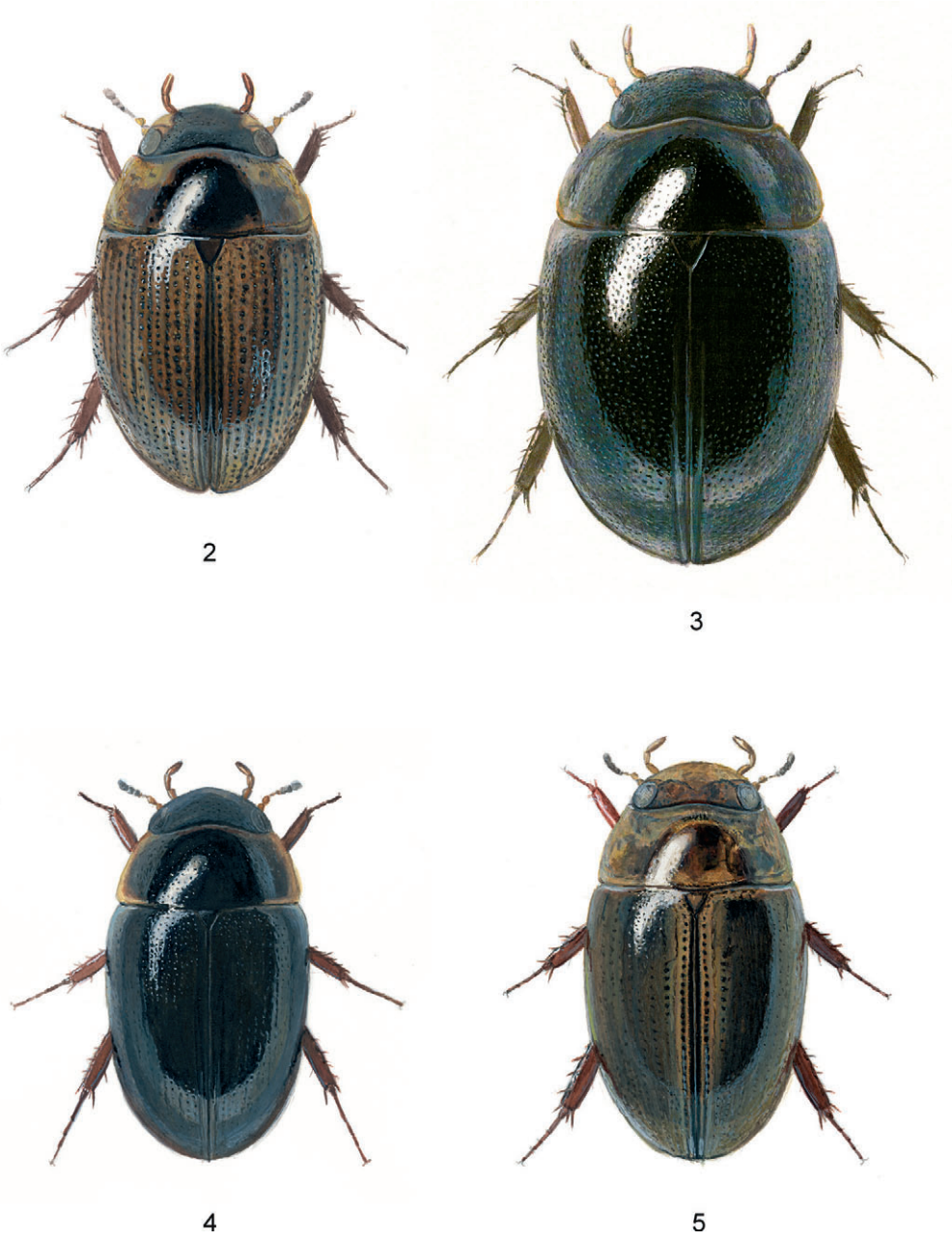

Figs. 2–5: Habitus of 2) *Anacaena horni*, 3) *A. littoralis*, 4) *A. nitens*, 5) *A. wattsi.*

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Anacaena horni (BLACKBURN, 1896)

Paracymus (*Paranacaena*) *horni* BLACKBURN 1896: 257.
Paranacaena horni: KNISCH 1922: 2; GENTILI 1993: 290.
Anacaena horni: d'ORCHYMONT 1942: 54.

TYPE LOCALITY: Australia, Queensland, Palm Creek.

TYPE MATERIAL EXAMINED: **Lectotype** ♂ (NHM): "T / 5481 / Palm Cr. [handwritten on mounting card] \ Type [round label] \ Australia / Blackburn Coll. / B.M. 1910-236 \ Paracymus / horni, Blackb. [handwritten] \ ♂ Lectotypus / Paranacaena / horni Blackb. / E.Gentili 1992 \ [aedeagus mounted separately on a transparent card]".

ADDITIONAL MATERIAL EXAMINED:

AUSTRALIA: ACT: Lake Burley Griffin, at edge of water, 1.IV.1969, Britton & Misko; 16 exs. (NHM): Padday's River, nr. Murray's Corner, 3.IV.1965, Stn.No. 231, M.E. Bacchus; 7 exs. (NHM): same data, Stn.No. 232; 1 ex. (NHM): Canberra, stream entering L. Burley-Griffin, Stn.No. 221, 30.III.1965, M.E. Bacchus; 4 exs. (NHM): Near Canberra, Stn.No. 219, 28.III.1965, M.E. Bacchus; **NSW:** 1 ♂ (MCZ): Jannali near Sydney, I.1932, "Australia / Harvard Exp., / Darlington \ [male genitalia mutilated, separately fixed on a transparent card] \ Holotypus [red label] / E. Gentili 1996 \ E. Gentili det., 1996 / Paranacaena alterna n.sp.\ MCZ Type \ Aug-Dec 2005 / MCZ Image / Database" (*Paranacaena alterna* has not been published); 3 exs. (ISNB): "Sydney / C. Darwin / 87–42"; 1 ex. (NHM): Sydney, Sharp Coll. "1905-313"; 1 ex. (MSNV): Sydney, I.1932, Harvard Exped., Darlington; 5 exs. (SAMA): Sydney, Clarence R., Griffith Coll., Lea; 3 exs. (SAMA): Sydney Cove, Griffith Coll., Lea; 2 ♂♂ (ISNB): Manly, Sydney, H. Tricke, "ded.", 27.I.1912, "Kniz det. Horni Bl."; 41 exs. (NHM): Near Sydney, Ku-ring-gai Chase, Coal and Candle Creek, 23.III.1965, Stn.No. 211, M.E. Bacchus; 31 exs. (NHM): Shaw Creek, ca. 8 miles Springwood-Richmond Rd., Stn.No. 214, 24.III.1965, M.E. Bacchus; 1 ex. (NHM): Near Hornsby, Galston Gorge, Stn.No. 218, 26.III.1965, M.E. Bacchus; 12 exs. (NHM): Wentworth Falls, Blue Mts., Stn.No. 213, 24.III.1965, M.E. Bacchus; 1 ex. (NMW): Blue Mts., Govetts Leap / Blackhieth, 1000 m, 15.I.1993, G. Wewalka; 1 ♂ (MSNV): Blue Mts., Megalong Valley, 350 m, 20.I.1932, Harvard Exped., Darlington; 2 exs. (MSNV): The Dorrigo, 3000 ft., II.1932, Harvard Exp., Darlington; 11 exs. (MSNV, SAMA): Waterfall, I.1968, C. Watts; 10 exs. (SAMA): 2 km N Batemans Bay, large shallow swamp, 2.XI.1997, C. Watts; 14 exs. (SAMA): 2 km N Batemans Bay, 18.IV.1997, C. Watts; 20 exs. (SAMA): 14 km W Delagate, Delagate River, wide, shallow, fast, clean, also at side pond, weed chocked, clean, 4.XI.1997, C. Watts; 1 ex. (SAMA): Bluff River, 18 km S of Tenterfield, 29°12'04"S 152°00'38'E, 29.VIII.2004, A. Glaister; 7 exs. (SAMA): Smith's Lake, in vegetation at side of large fresh water lake, V.1970, C. Watts; 4 exs. (SAMA): Failford 8 km N, small dam in grass/forest, clear, in bulrushes at edge, stamped on vegetation, 18.VIII.1997, C. Watts; 5 exs. (SAMA): 8 km N Bombala, small farm dam and adjacent small pond, sedges at edge, clear, open tussock grassland, side of hill near some trees, no stock, 3.XI.1997, C. Watts; 1 ex. (SAMA): Barrington, C. Watts; 3 exs. (SAMA): Ulladallah, pond in creek, shallow to 2 ft, sedges and sphagnum, at forest edge, still, 2.XI.1997, C. Watts; 2 exs. (SAMA): Braidwood, small river, moderate movement, pooling, little vegetation, 19.I.1997, C. Watts; 10 exs. (SAMA): Bendolba, in newish grassy creek, rushes, in open cow paddock, pooling, and in bed of shallow river with pools in river at sides, 26.XI.1995, C. Watts; 5 exs. (SAMA): Berry, at edge of small farm dam, in open, well vegetated, I.1968, C. Watts; 5 exs. (SAMA): 20 miles W Nerringa, in shallow pool beside river, sandy, with some dead leaves, veg. part shaded, Eucalypt forest, I.68, C. Watts; 1 ex. (SAMA): Tamworth 12 km E, running water through cow paddock, eutrophic, well vegetated (grass) at edge, 25.XI.1996, C. Watts; 1 ex. (SAMA): Cabbage Tree Creek, Nelligan 20 km W, quite wide river, wadeable, clean, stony, in vegetation at banks and in recently flooded areas, 30.I.1996, C. Watts; 1 ex. (SAMA): 2 km S Nowra, 1–2 m^2 pool, 6–12 inches deep, with very little vegetation, 27.XI.1998, C. Watts; 2 ♀♀ (ZMUC): Junction Guyra – Tingha Rd., Ollers Creek, 5.IX.1961, D.J. Woodland; 1 ex. (NMW): ca. 35 km N Dungog, Chichester State Forest, Telegherry Forest Park, 300 m, UV light along river, 18.XII.1990, Pollock & Reichert; 1 ex. (ZMUC): Kara Creek, 13 km "NEbyE" of Jindabyne, 16.III.1979, T. Weir; 18 exs. (NHM): Rock Flat Creek, 7 miles E of Cooma, Stn.No. 231, 31.III.1965, M.E. Bacchus; **NT:** 2 exs. (SAMA): 6 km SE Mt. Borradaile, drying creek-bed pool, 50 m long, 1 m deep, at edges in dead leaves, 8.X.1998, C. Watts; 1 ex. (SAMA): 5 km SE Mt. Borradaile stn., 8.X.1998, C. Watts; 2 exs. (SAMA): 5 km SE Mt. Borradaile stn., 27.V.1999, C. Watts; 1 ex. (SAMA): 1 km W Gubara, Kakadu NP, small, low gradient creek, sandy and rocky bottom, 2–3 ft wide, max. to 1 ft deep, some aquatic vegetation in places, 29.I.1999, C. Watts; 5 exs. (SAMA): Nawurlandja Kakadu NP, near Nourlangi rock, slow, small, gravelly creek and rock pools, on rock, no fish, 18.III.1998, C. Watts; 1 ex. (SAMA): Nawurlandja Kakadu NP, moderate creek, slightly running, good large rock holes and pools, to 6 ft, clear, sand and rock base, 22.III.1999, C. Watts; 3 exs. (SAMA): Nawurlandja Kakadu NP, in side ditch and creek across road, 29.I.1999, C. Watts; 1 ex. (ZMUC): Standley Chasm, from pool at head of chasm, 7.II.1966, "Britton, Upton, McInnes"; 9 exs. (CLH): Kakadu NP, Jim Jim Falls Camp Area, 60 m, 13°16.218'S

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132°49.276'W, "Lok. 2", 26./27.XI.1996, L. Hendrich; 6 exs. (CLH): Kakadu NP, Gungurul Lookout, creek, ca. 50 m, 13°59.359'S 132°19.904'W, "Lok. 11", 1.XI.1996, L. Hendrich; 5 exs. (CLH): Kakadu NP, Gubara, 50 m, "Lok. 1", 25.X.1996, L. Hendrich; 3 exs. (CLH): Kakadu NP, Barramundi Gorge, Maguk, ca. 50 m, stream, "Lok. 10", 31.X.1996, L. Hendrich; 38 exs. (CLH): Kakadu NP, Gunlom Camp Area, pool in Monsoonal Forest, ca. 50 m, 13°26.082'S 132°24.929'W, "Lok. 15", 3.XI.1996, L. Hendrich; **Q:** 2 exs. (SAMA): Tambourin Mt., 1893, C. Wild; 2 exs. (SAMA): Stanthorpe, I.1961, C. Watts; 5 exs. (MSNV, SAMA, 1 ex. from SAMA lacking head and prothorax): Mc Ilwraith Rng., Weather Stn., 23.VII.1982, C. Watts; 3 exs. (SAMA): Coomera River, 20 km W Canungra, among stones in wide shallow slowly flowing large river, 22.VIII.2004, A. Glaister; 1 ex. (SAMA): Girraween NP, 28°49'45"S 151°56'22"E, 29.VIII.2004, A. Glaister; 2 exs. (SAMA): Wallaman Falls, 6 km E, very small rock pool (2 sieve size), with small rock overhang and large stones, 6.XI.95, C. Watts; 2 exs. (SAMA): Bluewater 8 km N, Leichardt Creek, shaded lagoon in river, a few lilies, reedy sides, 31.X.1995, C. Watts; 1 ex. (SAMA): Bluewater 8 km N, shallow, no to slight water movement, 3.XI.1995, C. Watts; 1 ex. (SAMA): "N. Qld." Peach Creek, shallow stony creek, some dead leaves, still, at edge of rainforest, 24.VII.1982, C. Watts; 1 ♀ (NHM): Gold Creek, 7 miles W of Brisbane, 2.IV.[year missing] "B.M.1973-346", CSIRO-Expedition, J.A. Grant; 2 exs. (NHM): Brisbane, "Sharp Coll. 1905-313"; 5 exs. (CLH): Eungella NP, Broken River Track, 720 m, 13.XI.1996, "Lok. 23", L. Hendrich; **SA:** 2 exs. (SAMA): Mt. Gambier, I.1959, C. Watts; 4 exs. (SAMA): Robe 10 km S, small ditch, acidic, peat swamp, I.83, C. Watts; **T:** 2 exs. (NHM: mounted on one card, 1 ex. severely damaged): "Tasmania"; 2 exs. (SAMA): Launceston, Lea; 1 ex. (SAMA): Murchinson Hwy, 16 km N Waratah Rd., 28.XI.2000, C. Watts; 1 ex. (SAMA): 2 km SW Ellendale, 1.XII.2000, C. Watts; **V:** 1 ex. (MSNV), 7 exs. (SAMA): Healsville, small, shallow roadside ditch, heavy shade, dead vegetation, still, XII.1968, C. Watts; 9 exs. (SAMA): Omeo, wide shallow river, 6.XI.1997, C. Watts; 18 exs. (SAMA): 12 km SW Orbost, Simpson Creek, large, shaded, still, isolated pools, weedy, dead leaves, clear, 16.I.1997, C. Watts; 19 exs. (SAMA): 12 km SW Orbost, Simpson Creek, 5.XI.1997, C. Watts; 2 exs. (SAMA): SW Orbost, Simpson Creek, "as before, higher (full)", 30.XI.1998, C. Watts; 2 exs. (SAMA): Dartmoor, open forest, drying pool, 11.X.1997, C. Watts; 1 ex. (SAMA): Mirranatwa, 10 km NE, small creek bed, drying pool, stony, dead leaves, forest, 12.X.1997, C. Watts; 2 exs. (SAMA): Stratford, wide, shallow, pebbly river "like tropical ones", in stones at edges "where clean(er)", 7.XI.1997, C. Watts; 6 exs. (SAMA): Buangor, Billy Billy Creek, large, pooling, still, clear water, weed, 9.XI.1997, C. Watts; 1 ex. (FMNH): Tanjil R., E.Branch, 4 km SE Tanjil Bren, 490 m, 37°50'S 146°12'E, wet sclerophyll *Nothofagus cunninghami*, wet leaves and flood debris, forest stream, 10.II.1987, A. Newton & M. Thayer "FMHD #87-263"; 8 exs. (CLH): 12 km N Mansfield, Broken River, 350 m, 25.II.1998, "Lok. 47/88", L. Hendrich; 3 exs. (CLH): 12 km N Mansfield, Broken River, 200 m, 16.II.1998, "Lok. 48/89", L. Hendrich; **WA:** 9 exs. (SAMA): Killagurra Spring, 23°44'S 122°25'E, 2.VII.2003, C. Watts; 5 exs. (SAMA): Trugllenden Pool, 14 km E Newman, 27.IX.2004, C. Watts; 2 exs. (SAMA): Weano Gorge, Karijini NP, Pilbara, 6.X.2002, R. Leys; 8 exs. (SAMA): Durbah Springs, 2.VII.2003, C. Watts; 4 exs. (SAMA): Calvert Range, 23°58'S 122°43'E, 3.VII.2003, C. Watts; 2 ♂♂ (ISNB): Swan River, ex coll. Lea, coll. A. d'Orchymont; 1 ex. (MSNV): Millstream Chichester NP, at light in open eucalypt "paperbark" woodland, kangoroo grazed grass, 28.X.1970, E.B. Britton; 1 ♀ (FMNH): Dampier, Dampier Isl., intercourse Rd., pool with stagnant water, 2.X.1976, J.B. Kethley, "FMHD #76-5005".

DESCRIPTION: Total length 1.9–2.4 mm; maximum width 1.1–1.4 mm; EI 1.06–1.27. Habitus (Fig. 2): distinctly convex dorsally, narrow, widest at midlength, distinctly attenuate apically, apical portion narrowly rounded. Lateral elytral margins slightly inflected, not completely visible in dorsal view.

Head: Clypeus variably colored: from entirely light brown with a narrow dark rim posterior to labrum, to dark brown (in some individuals almost black) medial portion and distinct yellowish preocular patches. Frons from dark brown to yellow. Labrum dark brown. Clypeus about as long as diameter of eye, without distinct anterolateral angles, CI=4.3. Punctures on clypeus and frons moderately fine, unequally sized, moderately densely arranged with unequal distances, interspaces 1–3 x as wide as one puncture. Eyes very weakly constricted by clypeal extension, OI=4.4. Antenna composed of eight antennomeres. Maxillary palpus moderately stout, palpomere 2 rather weakly inflated, palpomere 4 apically indistinctly infuscated, or infuscation absent. Mentum flat, with widely spaced, fine, setiferous punctures; microsculpture absent; lateral margins straight. Labial palpi slender.

Thorax: Pronotum largely yellowish to light brown with variably sized central dark brown patch, sometimes split into three small patches, sometimes with one central patch surrounded by four

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dark spots; central patch not always reaching anterior margin; in some individuals mesal portion of anterior pronotal margin with a dark brown rim detached from central patch. Pronotal punctures very fine, finer than on frons, interspaces about 3–4 x as wide as one puncture. Prosternum slightly bulged, without carina. Elytra variably colored, from light to dark brown; often dark brown with lighter areas, mainly laterally and apically, in some individuals also near scutellar shield, or largely light brown with darker areas or stripes. In lighter individuals punctures surrounded by darker brown patches. Setae absent from lateral borders of pronotum and elytra; in some individuals very fine, indistinct setae perceptible on apical portion of elytra, arising from dorsal face of elytral edge. Shoulder regions in some individuals slightly accentuated, sometimes with a darker brown patch, distinct callosity absent. Anterior elytral declivity narrow. Sutural stria recognisable in posterior 0.7 of elytra in dorsal view. Punctures on elytra (Fig. 21) moderately fine to very fine (finer on scutellar shield), distinctly coarser than on pronotum, serially distributed, primary and secondary rows present. Mesoventrite with distinct median protuberance. Procoxae without spine-like setae. Ventrites and legs dark brown. Profemur and mesofemur almost entirely covered with hydrofuge pubescence. Metafemoral pubescence restricted to anterior margin and proximal portion, with distinct, concave hairline. Metatarsus slightly shorter than metatibia.

Aedeagus (see aedeagus of *A. lindi*: Figs. 10–11): Main piece of phallobase less than half as long as parameres, wider than long, with slightly rounded lateral margins, abruptly narrowing to manubrium, distinctly demarcated from phallobase. Manubrium with spine-like extension. Parameres wide basally, lateral margins distinctly curved, mesal margins very slightly curved, almost parallel-sided at midlength; apex broadly rounded, weakly sclerotized. Median lobe almost parallel-sided with a bluntly pointed apex. Median lobe shorter than parameres, with corona in apical position, basal apophyses very long, longer than main piece of median lobe, with distinct extension into phallobase. Base of median lobe not visibly connected with parameres.

DIFFERENTIAL DIAGNOSIS: This species shows affinities to *A. lindi* and *A. wattsi*. For differences see under these species.

BIONOMICS: This species is found in various types of vegetation (tussocks of grass, sedges, weeds, sphagnum, bulrush, reeds, dead leaves) at the edge of fresh water lakes, ditches, shallow swamps, ponds, dams, flooded areas, various pools (mostly shallow, even drying), in gravelly or sandy creeks, and among stones in shallow, slowly flowing rivers. It can also be collected by UV light traps.

DISCUSSION: GENTILI (1993) lists the following morphological differences of *A. horni* and *A. lindi*: paler dorsal color, more distinct linear arrangement of elytral punctation, particularly in the periscutellar area, more slender body shape, and the absence of an "elytral basal furrow" (anterior elytral declivity). The difference in coloration and punctural arrangement can be confirmed by the present study. The difference in the body shape is very slight. An anterior elytral declivity is present in both species, though less distinct in *A. horni*. In addition to the characters listed by GENTILI (1993) the following features allow *A. horni* to be distinguished from *A. lindi*: lateral elytral margins more strongly inflected in *A. horni*, elytra therefore not completely visible in dorsal view; apical infuscation of maxillary palpomere 4 absent in many individuals of *A. horni*, present in all specimens of *A. lindi* examined; length ratio of metatarsus/metatibia greater in *A. horni* than in *A. lindi*. No differences could be observed between their aedeagi.

DISTRIBUTION: Australia (ACT, NSW, NT, Q, SA, T, V, WA).

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Anacaena lindi (BLACKBURN, 1889)

Paracymus (*Paranacaena*) *lindi* BLACKBURN 1889: 821.
Paranacaena lindi: KNISCH 1924: 168; GENTILI 1993: 288.
Anacaena lindi: d'ORCHYMONT 1942: 38.

TYPE LOCALITY: Australia, South Australia, Port Lincoln.

TYPE MATERIAL EXAMINED: **Lectotype** ♀, **Paralectotype** ♀ (NHM, both exs. mounted on one card): "Type [round label] \ 550 \ Australia / Blackburn Coll. / B.M. 1910-236. \ Paracymus / lindi, Blackb. [handwritten] \ 1. ♀ Lectotypus / 2. ♀ Paralectotypus / Paranacaena / lindi Blackb. / E.Gentili 1992".

ADDITIONAL MATERIAL EXAMINED:

AUSTRALIA: ACT: 1 ♀ (AEZS): Murray's Corner, Paddy's River, 2.I.2001, W.D. Shepard; **NSW:** 1 ex. (NMW): Blue Mts., Govetts Leap at Blackhieth, 1000 m, 15.I.1993, G. Wewalka; 1 ♂ (MSNV), 3 exs. (FMNH): Chichester SF, nr. Dungog [N of Newcastle], The Mountaineer, 970 m, 32°07'S 151°41'E, *Nothofagus moorei* forest, berl. leaf and log litter, forest floor, 26.XII.1986, A. Newton & M. Thayer; 1 ex. (FMNH): Chichester SF, nr. Dungog, The Mountaineer, 930 m, 32°08'S 151°41'E, *Nothofagus moorei* and *Eucalyptus* forest, berl. leaf and log litter, forest floor, 26.XII.1986, "776", A. Newton & M. Thayer; 1 ex. (SAMA): Sydney Cove, Griffith Coll.; 1 ♂, 1 ♀ (SAMA): Sydney 1.I.1895; Tarago, Griffith Coll.; 1 ex. (SAMA): Boyne Creek, Yadboro Rd., 35°23'45"S 150°16'21" E, 26.XI.01, A. Glaister; 5 exs. (SAMA): 20 km W Nelligan, 3.XI.1997, C. Watts; 2 exs. (FMNH): Mt. Wilson, rainforest, litter nr. stream, 18.VII.1983, L.E. Watrous, "FMHD #83-276"; 1 ex. (MSNV): Narabeen Lagoon, Xostrum & Casurina drift, 19.VII.1983, L.E. Watrous, "FMHD #83-277"; 2 exs. (NHM): Wentworth Falls, Blue Mts., Stn.No. 213, 24.III.1965, M.E. Bacchus, "B.M. 1965-120"; 1 ♀ (NHM): Shaw Creek, ca. 8 miles Springwood-Richmond Rd., Stn.No. 214, 24.III.1965, M.E. Bacchus, "B.M. 1965-120"; 12 exs. (CLH): Goulburn – Oberon Road, Huttons Ridge, Middle Station Creek, 1008 m, 9.II.1998, "Lok.34/75", L. Hendrich; **Q:** 13 exs. (SAMA): Wallaman Falls, 6 km E, very small rock pool (2 sieve size), with small rock overhang and large stones, 6.XI.1995, C. Watts; 2 exs. (NHM): 20 miles N of Cairns, Cascade Creek, pot-hole pool in rock, 2.VI.1954, M. Laird; **SA:** 1 ex. (SAMA): Hallets Cove, at side of moderate pool, sandy, emergent vegetation with some dead plant, XI.1956, C. Watts; 1 ex. (SAMA): 1 ex. (SAMA): R. Torrens Gorge Rd., Castanbul, 17.V.76, R. Shiel; 1 ♂ (MSNV), 12 exs. (FMNH): Flinders Ranges, Telowie Gorge, in litter along stream, 30.IV.1983, L.E. Watrous, "FMHD #83–635"; 3 exs. (SAMA): Flinders Ranges, First and Second Springs, appr. 12 km NW Blinman, 12.V.1981, J.A. Forrest; 3 exs. (MSNV, SAMA): Flinders S.R., Woodendimna Creek, Nirrana, 16.XII.1976, Coll. Bishop, T.H. Diener; 9 exs. (MSNV, SAMA): Flinders Ranges, Warren Gorge, 22 km N Quorn, in water, 8.V.1981, J.A. Forrest; 11 exs. (MSNV, SAMA): Flinders Ranges, First and Second Springs, appr. 12 km NW Blinman, 10.V.1981, J.A. Forrest; 10 exs. (SAMA): Flinders Ranges, Glass Gorge, First and Second Springs, appr. 12 km NW Blinman, 10.V.1981, J.A. Forrest; 1 ex. (SAMA): Flinders Ranges, Glass Gorge, 12 km NW Blinman, 16.V.1981; 1 ex. (SAMA): Adams Gully road, 13 km W Meadows, Kuipo Forrest, in large natural pool between moderate creeks, still weedy, in forest, 26.IX.1996, C. Watts; 4 exs. (SAMA): Meadows, 13 km W, 35°11'S 138°36'E, 28.IX.1996, C. Watts; 1 ex. (SAMA): Martins Well, Stn. 5A, small shallow pool, sandy, in open forest, 27.IX.1975, C. Watts; 1 ex. (SAMA): Flinders Ranges, Moro Gorge Waterhole, 300 m away at campsite, 5.IX.1982, W. Anderson; 2 exs. (SAMA): Flinders Ranges, Brachina Creek, near Heysen Hill, 9.V.1981, J.A. Forrest 1981; 1 ex. (SAMA): Flinders Ranges, Nooltana Creek, 13 km NNW Hawker, 17.V.1981, J.A. Forrest; 2 exs. (SAMA): Flinders Ranges, Munyallina Creek, 6 km SW Wooltana HS, 12.V.1981, J.A. Forrest; 1 ex. (SAMA): Flinders Ranges, Willochra Creek, 2 km E Proby's grave, 8.V.1981, J.A. Forrest; 1 ex. (SAMA): Flinders Ranges, Willigon Creek, Third spring, 15.XII.1976, Bishop & Diener; 2 exs. (SAMA): Flinders Ranges, Bunyeroo Creek, 1 km E ABC Range, 9.VI.1981, J.A. Forrest; 3 exs. (SAMA): Oratunga Creek, Third Spring, 31°02'S 138°35'W, Aust. water quality center 3667, 28.VI.1994; 2 exs. (SAMA): Artimore Creek, Nildottie Spring, 31°03'S 138°47'W, Aust. water quality center 38.1995; 1 ♂, 1 ♀ (SAMA): Rocky River No. 2, 35°55'S 136°48'W, Aust. water quality center 3707, 10.V.1995; 1 ex. (SAMA): Little Para Rd. strm. dam, 34°45'S 138°43'W, Aust. water quality center 3459, 11.X.1994; 1 ex. (SAMA): Eyre Creek at Watervale, 33°58'S 138°39'W, Aust. water quality center 3553, 12.X.1994; 1 ex. (SAMA): Oraparinna Creek, Dingly Dell, 31°21'S 138°42'W, Aust. water quality center 3664, 15.XI.1994; 1 ex. (SAMA): Eyre Peninsula [Port Lincoln], stream near Epsom Sp., White Flat Rd., 14. XII.1976, Bishop & Diener; 5 exs. (SAMA, 1 ex. lacking head and pronotum): Flinders Ranges, Old Wirrialpa Sp., 16.XII.1976, Bishop & Diener; 1 ♀ (SAMA): Alligator Gorge, at side of small creek, partly shaded, sandy, dead leaves, some vegetation, probably still, VI.1959, C. Watts; 2 exs. (SAMA): Flinders Ranges, "Parachilna Hale [handwritten] \ C / 128 [handwritten, round label]"; 1 ♀ (SAMA): Mt. Lofty [E of Adelaide], Coll. Griffith; 1 ex. (SAMA): Tookayerta Creek, 21.VIII.1984, W.D. Williams coll.; 2 ♀♀ (NHM): Hindmarsh Falls, N. Tindale, 24.XII.1961, E.B. Britton, "B.M. 1962-153"; 1 ♂ (NHM): Deep Creek, Waitpinga, 1.III.1949, E.B. Britton, "Brit. Mus. 1950-

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18"; 1 ♀ (CLH): Fleurleu Peninsula, Mt. Compass, Wetland Board-walk Conservation Area, 400 m, 24.II.1998, "Lok. 57/98", L. Hendrich; **V:** 1 ♂ (MSNV), 3 exs. (FMNH): Mt. Buffalo NP, above Eurobin Point, 820 m, 36°42'S 146°50'E, wet sclerophyll forest, wet debris at waterfall base, 23.I.1987, A. Newton & M. Thayer; 4 exs. (FMNH): Mt. Buffalo NP, Eurobin Creek, 450 m, 36°43'S 146°50'E, wet sclerophyll forest, wet leaves and flood debris, forest stream, 12.II.1987, A. Newton & M. Thayer; 1 ex. (FMNH): Mt. Buffalo NP, 1050 m, *Eucalyptus*, algae on wet rock face, 18.–19.I.1980, A. Newton & M. Thayer; 1 ex. (FMNH): Mt. Worth NP, Trevorrows Mill, 300 m, 38°17'S 146°00'E, wet sclerophyll forest, berl., leaf and log litter, forest floor, 7.II.1987, A. Newton & M. Thayer, "FMHD #87-237"; 4 exs. (SAMA): Marysville [40 km E Melbourne], at side of a small creek/river, stony, "probably some movement", XII.1968, C. Watts; 9 exs. (SAMA): Diamond Creek [tributary of Yarra River], III.1901; 4 exs. (SAMA): Acheron River, Narbetong, smallish, rapid, in forest, some stony banks, 2.XII.1998, C. Watts; 1 ex. (SAMA): St. Ronans Well (between Healsville and Marysville), 8 km NE Healsville, small mountain pool, springfed, weed and dead leaves at edge, 2.XII.1998, C. Watts; 3 exs. (SAMA): Omeo, wide shallow river, 6.XI.1997, C. Watts; 8 exs. (SAMA): 3 km S Fisherman's Rest, shallow ditch at side of road, dead leaves, 6.XI.1997, C. Watts; 1 ex. (SAMA): Delleys Dell nr. Halls Gap, dead leaves and mud seepage, "perhaps 2 inches in odd places", 11.X.1997, C. Watts; 1 ♂ (ZMUC): 22 km N Portland woods nr. "Cut Out Dam picnic grounds" Caboboonee State Forest, flight interception trap, 24.II.1990, Wcislo; 1 ♂ (FMNH, apices of parameres destroyed): Marysville, XII.1968, C. Watts; **WA:** Yanchep, 32 miles N of Perth, 13.–23.XI.1935, R.E. Turner, "B.M.1936-28".

DESCRIPTION: Total length 2.0–2.9 mm; maximum width 1.1–1.6 mm; EI 1.09–1.36. Habitus: distinctly convex dorsally, rather narrow, widest very slightly anterior to midlength, distinctly attenuate apically, apical portion narrowly rounded. Elytral margins completely visible in dorsal view in most individuals.

Head: Clypeus and frons dark brown, clypeus with large yellowish preocular patches. Punctures on clypeus and frons moderately fine, densely distributed, irregular, interspaces on average as wide as one puncture. Clypeus about as long as diameter of eye, with blunt anterolateral angles and straight anterior margin, CI=4.2. Eyes weakly constricted by anterior clypeal extension. Antennae composed of eight antennomeres, OI=3.6. Maxillary palpus moderately slender, palpomere 2 weakly inflated, palpomere 4 with apical infuscation. Mentum flat with straight lateral margins, with widely spaced, fine, setiferous punctures, microsculpture absent. Labial palpi moderately slender.

Thorax: Prosternum bulged, carina absent. Pronotum dark brown to blackish with variably sized, indistinctly demarcated brighter lateral margins (in most specimens narrow). Pronotal punctures fine, shallow, rather densely distributed, interspaces ca. 2–3 x as wide as one puncture. Microsculpture absent. Elytra dark brown to almost black with indistinct brighter areas of variable size, mainly at apical and lateral portion; some individuals with largely light brown elytra. Anterior elytral declivity distinct. Setae absent from lateral borders of pronotum and elytra. Callosity on shoulder regions absent. Sutural stria recognisable in posterior 0.7 of elytra in dorsal view. Punctures on elytra (Fig. 22) moderately fine, with some rows of subserially arranged punctures alternating with unordered punctation; arrangement in primary and secondary series absent. Some coarser punctures present near lateral margins. Mesoventrite with distinct median protuberance. Procoxae without spine-like setae. Legs and ventrites dark brown. Pro- and mesofemur ventrally almost entirely covered with hydrofuge pubescence. Metafemoral pubescence restricted to a very narrow stripe at anterior margin and to proximal portion, with concave hairline. Metatarsus in most individuals distinctly shorter than metatibia.

Aedeagus (Figs. 10–11): See description of aedeagus of *A. horni*.

DIFFERENTIAL DIAGNOSIS: *A. lindi* has morphological affinities particularly to *A. horni*. It can be distinguished from the latter by the elytral punctation (primary and secondary rows present in *A. horni*, absent in *A. lindi*). These two species also differ in the following features, even though in few individuals intermediate character states occur: lateral elytral margins less distinctly inflected, (almost) totally visible in dorsal view; color of head, pronotum and elytra

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much darker; punctation of head and elytra denser, length ratio of metatarsus/metatibia smaller. No difference can be observed in the morphology of the aedeagus.

BIONOMICS: This species is found in litter along streams, in vegetated or sandy natural pools, in emergent vegetation and dead plants, in leaves and mud seepage, on algae on the surface of wet rocks, in shallow ditches at roads, in springs, in various vegetation (weed, dead leaves) in still parts of creeks, in small, rapid rivers with stony banks, in wet debris at waterfall base, and in rock pools. It was also collected in leaf and log litter on the floor of a *Nothofagus moorei* and *Eucalyptus* forest and by flight interception trap. *Anacaeana lindi* must be viewed as an aquatic species which can inhabit a wide range of habitats.

DISCUSSION: The close morphological affinity to *A. horni* was already pointed out by GENTILI (1993) whose observations are evaluated under *A. horni* in the present study.

DISTRIBUTION: Australia (ACT, NSW, Q, SA, V, WA). Not yet confirmed from Tasmania. Specimens reported by GENTILI (1993) from different localities in Tasmania are in fact *A. horni.*

Anacaena littoralis d'ORCHYMONT, 1942

Anacaena littoralis d'ORCHYMONT 1942: 56.
Paranacaena littoralis: GENTILI 1993: 291; GENTILI 2002: 90.
Paranacaena hibrida GENTILI 2002: 79; syn.n.

TYPE LOCALITY: Australia, Victoria, Sea Coast.

TYPE MATERIAL EXAMINED: ***Anacaena littoralis***: **Holotype** ♀ (ISNB): "♀ \ Coll. R.I.Sc.N.B. / Australia – Vict. / Sea Coast / Victoria / coll. French [handwritten] \ A. d'Orchymont det. / Anacaena / littoralis / m. \ ♀ Holotypus / Anacaena / littoralis d'Orch. / E.Gentili 1992". **Paratype**: The single specimen (♀) does not exist any more. The ISNB houses a pin with a label: "exemplaire / manque".

Anacaena hibrida: **Holotype** ♂ (ANIC): "(31.33 S 116.28 E) / Toodyay, W.A. / 14.x.1970, M.S. Upton \ Paranacaena / hibrida / Holotypus \ Paranacaena hibrida m. / E.Gentili 2000". **Paratypes**: 2 exs. (ANIC, MSNV): same data; 3 exs. (ANIC, MSNV): WA, Baker's Hill, 5 miles W of Northam, 31.47° S 116.23° E, 15.III.1969, light trap (one additional specimen is mentioned in the original description, which has not been examined); 2 exs. (ANIC): WA, Kuliba, Ravensthorpe-Hopetoun Rd., 21.IX.1968, E.B. Britton "Paracymus pygmaeus / det. C. Watts 1966"; 1 ♂ (ANIC): WA, South Dandalup R., 8 m. E of Pinjarra, 32°35'S 115°53'E, clear brook flowing over stones, 17.XI.1969, E.B. Britton; 2 exs. (SAMA): [WA] "Armandale / WAT / 62 D.F."; 6 exs. (MSNV, NMW, SAMA; the specimens of SAMA mounted on one card): "WA, Swan R., A.M. Lea, 1870".

ADDITIONAL MATERIAL EXAMINED:

AUSTRALIA: ACT: 1 ex. (SAMA): Paddy River, 8 km NW Tharwa, 35°27'39"S 149°01'19"E, 1.I.2001, A. Glaister; 2 exs. (AEZS): Paddy's River, 7 km NW Tharwa, 7.I.2001, W.D. Shepard; 2 exs. (AEZS): Tharwa, Tharwa Bridge Res., Murrumbidgee River, 31.XII.2000, W.D. Shepard; 1 ex. (ZMUC): Black Mt., light trap, 22.XII.1965, M.S. Upton; 1 ♂ (NHM): Paddy's River, nr. Murray's Corner, 3.IV.1965, Stn.No. 231, M.E. Bacchus, "B.M.1965-120"; **NSW:** 1 ex. (SAMA): "NSW"; 2 exs. (FMNH): Khancoban, below Khancoban Dam, 30 m, 36°13'S 148°06'E, dry sclerophyll forest, at UV blacklight along river, 13.II.1987, A. Newton & M. Thayer; **V:** 15 exs. (MSNV, FMNH): Yarra River, 4.5 km SW Healesville, 80 m, 37°41'S 145°29'E, dry sclerophyll forest, UV blacklight along river, 6.II.1987, A. Newton & M. Thayer "FMHD #87–259"; 1 ex. (SAMA): Mirranatwa, 10 km NE, small creek bed, drying pool, stony, dead leaves, forest, 12.X.1997, C. Watts; 1 ex. (SAMA): Omeo 13 km NW, Jim and Jack Creek, small running creek, in open, draining marsh, in deeper rock pool, 4.XI.1997, C. Watts; 1 ex. (SAMA): Buangor, Billy Billy Creek, large, pooling, still, clear water, weed, 9.XI.1997, C. Watts; 1 ex. (SAMA): 6 km N Noojee, Toorongo River, open, wide, fast, shallowish, in shallow dirty swampy water in side creek, 1.XII.1998, C. Watts; 2 ♂♂ (FMNH): Warburton 12 km E, 215 m, *Eucalyptus* forest, leaf litter, stream edge, 12.–16.I.1980, A. Newton & M. Thayer; **WA:** 1 ♂ (NHM): "Australia K.G.S.d [handwritten] \ Sharp Coll. / 1905-313"; 1 ex. (SAMA): 15 km NE Pemberton, shallow flooded paddock and bare shallow roadside ditch, 8.X.1996, C. Watts; 2 exs. (MSNV): Stream on road to Williams Bay, 24.IX.1965, E. Britton; 1 ex. (MSNV): "Donnybrook", 24.IX.65, W.A. Lea; 3 exs. (SAMA): "Donnybrook", 1870, W.A. Lea; 5 exs. (NMW, SAMA): SE Donnybrook, deep pool, reeds, dead leaves, 18.X.1996, C. Watts; 2 exs. (SAMA): "Kelmsrott Rd., D.E"; 1 ex. (SAMA): 8 km S Dwellingup, roadside dugout, to 1.5 ft, in very

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shallow water on gravel, 17.X.1996, C. Watts; 2 exs. (SAMA): 2 km SW N. Dandalup, Goldmine Hill Road, small, trinkling, small sieve sized pool, to four inches, 23.IX.2000, C. Watts; 4 exs. (SAMA): Pinjarra R., 1870, W.A. Lea; 1 ex. (FMNH): Mt. Chudalup St. Pk., 16 km S Northcliffe, wet moss on sand over seepage area near base of Chudalup, 4.XII.1986, J. Kethley; 1 ♂ (NHM): "Swan Riv. (handwritten on a red round label] \ Sharp Coll. / 1905-313".

DESCRIPTION: Total length 2.3–2.9 mm; maximum width 1.3–1.6 mm; EI 1.14–1.30. Habitus (Fig. 3): distinctly convex dorsally, moderately broad, widest slightly anterior to midlength, slightly attenuate apically. Elytral margins completely visible in dorsal view.

Head: Clypeus and frons black. Very indistinct brighter preocular areas present in some individuals. Punctures on clypeus and frons moderately fine, densely distributed, interspaces 1–2 x as wide as one puncture. Microsculpture absent. Clypeus as large as diameter of eye, with blunt anterolateral angles and straight anterior margin, CI=4.8. Eyes circular in dorsal view, dorsal and ventral portion distinctly separated by lateral extension of clypeus, OI=4.8. Antennae composed of eight antennomeres. Maxillary palpus moderately slender, palpomere 2 weakly inflated, palpomeres 1–3 yellow, palpomere 4 entirely dark brown or with distinct apical infuscation. Mentum flat with straight lateral margins; anterior margin simply rounded without emargination. Ventral face of mentum with widely spaced setiferous punctures, microsculpture absent.

Thorax: Pronotum dark brown to black with indistinctly brighter, rufous, narrow lateral margins. Pronotal punctures moderately fine, finer than on frons, densely distributed, interspaces 1–2 x as wide as one puncture. Prosternum without median carina. Elytra dark brown to black, brighter brown areas sometimes present on lateral margins and apically. Setae absent from lateral borders of pronotum and elytra. Callosity on shoulder regions absent. Anterior elytral declivity distinct. Sutural stria recognisable in posterior 0.7 of elytra in dorsal view. Punctures on elytra (Fig. 23) coarse, densely distributed, interspaces on average 1–2 x as wide as one puncture. Punctures unordered on most parts of elytra; short subserial rows of punctures present near lateral margins. Microsculpture absent. Mesoventrite with distinct median protuberance. Procoxae without spine-like setae. Legs dark brown like ventrites. Pro- and mesofemur ventrally almost entirely covered with hydrofuge pubescence. Metafemoral pubescence restricted to a very narrow stripe at anterior margin and to proximal portion. Metatarsus distinctly shorter than metatibia.

Aedeagus (Figs. 12–13): Main piece of phallobase about half as long as parameres, wider than long, abruptly narrowing to manubrium. Manubrium distinctly demarcated, with spine-like extension. Parameres slightly curved, widest at base, narrowing towards midlength, apex broadly rounded, very weakly sclerotized. Median lobe wide at base, evenly narrowing apicad, with bluntly rounded apex. Median lobe slightly shorter than parameres; corona very large, in subapical position, basal apophyses very long, about as long as main piece of median lobe, with distinct extension into phallobase. Base of median lobe mesally visibly connected with parameres.

DIFFERENTIAL DIAGNOSIS: *A. littoralis* has strong affinities to *A. sublineata.* It differs from the latter by the presence of an infuscated maxillary palpomere 4, by the equal distribution of punctures on pronotum and elytra, by the presence of distinct lateral rows of elytral punctures, by a smaller length ratio metatarsus/metatibia, and by a different aedeagus.

BIONOMICS: This species is found in different kinds of pools, in muddy or clear water, mostly in seepage, under dead leaves or plants. It was also collected at the edge of water in dry sclerophyll forest, and at UV blacklight.

DISCUSSION: In contrast to the observations published by d'ORCHYMONT (1942) and GENTILI (1993) the body form is not short but rather oblong oval and highly convex.

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GENTILI (2002) pointed out that *Paranacaena hibrida* is "similar to some species of Australia", and differs from all other species by the aedeagus, and additionally from *A. lindi*, *A. littoralis*, and *A. sublineata* by the absence of a metafemoral pubescence. GENTILI (1993) did not provide a description of the aedeagus of *P. littoralis.* The illustrations published by GENTILI (1993: Figs. 15, 16; 2002: Figs. 7, 8) suggest a different shape of the apical portion of the median lobe (pointed in *P. littoralis*, rounded in *P. hibrida*) and a different shape of the manubrium. However, re-examination of the male genitalia of the type specimens of *P. hibrida* and of additional material of both species revealed slight differences between some of the individuals, but in most of the specimens examined the shape of the male genitalia was identical. In contrast to the original description, a metafemoral pubescence restricted to the anterior margin is present.

DISTRIBUTION: Australia (ACT, NSW, V, WA).

Anacaena nitens (GENTILI, 1993), comb.n.

Paranacaena nitens GENTILI 1993: 293.
Gentilina nitens HEBAUER 2003: 112.

TYPE LOCALITY: Australia, Queensland, Buderim Mountain, Mooloolah.

TYPE MATERIAL EXAMINED: **Holotype** ♀ (SAMA): "Buderim-Mtn., Q. / Nr. Mooloolah [N of Caloundra, Brisbane] / C.J.W., Dec. 89 \ E.Gentili det., / Paranacaena / nitens m.\ SAMA Database / No. 25-008115". The label was wrongly cited as "C. Watts 1989" by GENTILI (1993). HEBAUER (2001) asserted that "C.J.W." is not identical with C.[Chris] Watts, and that the year of collection must have been 1889. **Paratypes**: 1 ♀ (SAMA): "Qu., Buderim Mt. / nr. Mooloolah / C.J.W. 12–1889 \ Paratypus \ E. Gentili det. \ SAMA Database / No. 25–008114". I have not examined the other three female paratypes mentioned by GENTILI (1993).

ADDITIONAL MATERIAL EXAMINED:

AUSTRALIA: Q: 89 exs. (CFH, CLH, NMW, SAMA): N. Queensland, Cape Tribulation, Daintree NP, Turpentine Road, 120 m, 8.XI. [not XII, as cited by HEBAUER (2003)] 1996, "loc.18", L. Hendrich; 1 ex. (ZMUC): 2 km WSW Cape Tribulation, "CT3 30 m", "Fl. trap JCU", 1.–28.II.1996, L. Umback; 1 ♂ (NMW): Daintree, 90 km N Cairns, 5 m, 23.I.1993, G. Wewalka.

DESCRIPTION: Total length 1.9–2.1 mm; maximum width 1.0 mm; EI 1.31–1.39. Habitus (Fig. 4): flattened-convex, narrow, elongate, widest slightly anterior to midlength, attenuate apically, apical portion narrowly rounded. Elytral margins completely visible in dorsal view.

Head: Clypeus and frons black without brighter preocular areas. Punctures on clypeus and frons moderately fine, densely distributed, interspaces 1–2 x as wide as one puncture. Microsculpture absent. Clypeus about as long as diameter of eye, with blunt anterolateral angles and straight anterior margin, CI=3.8. Eyes not emarginate anteriorly. Antennae composed of nine antennomeres, OI=3.7. Maxillary palpus slender, palpomere 2 not inflated, palpomere 4 with distinct infuscation. Mentum flat with straight lateral margins, anterior edge not emarginate, microsculpture absent.

Thorax: Pronotum black with narrow yellowish lateral margins. Pronotal punctures moderately fine, as on frons, moderately densely distributed, interspaces 1–3 x as wide as one puncture. Prosternum without median carina. Elytra black, with very narrow yellowish lateral margins, absent in some individuals. Pseudepipleura slightly more than half as wide as epipleura. Setae absent from lateral borders of pronotum and elytra. Callosity on shoulder regions absent. Anterior elytral declivity large. Sutural stria recognisable in posterior 0.7 of elytra in dorsal view. Punctures on elytra (Fig. 25) moderately fine, slightly more densely set than on pronotum, interspaces on average 1–2 x as wide as one puncture. All punctures with subserial to serial arrangement, alternating primary and secondary rows absent. Microsculpture absent. Mesoventrite bulged without median protuberance. Procoxae with few spine-like setae. Legs paler than ventrites. Profemur pubescent on proximal two thirds, mesofemur on proximal three

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fourths, and metafemur on more than proximal half with oblique hairline. Metatarsus slightly longer than metatibia. Meso- and metatarsus with long, fine swimming hairs, arising from dorsal face.

Aedeagus (Fig. 18): Phallobase about as long as parameres, manubrium broadly rounded, not distinctly demarcated from phallobase. Parameres knife-shaped, with distinctly curved lateral face and almost straight mesal face, widest at midlength, apices pointed. Median lobe wide at base, evenly narrowing apicad. Median lobe slightly shorter than parameres, with corona in subapical position; basal apophyses very short, without extension into phallobase. Base of median lobe mesally visibly connected with parameres.

DIFFERENTIAL DIAGNOSIS: This species is remarkably different from all other species of *Anacaena* from the Australian Region. Striking differences are: comparatively narrow and rather flat body shape; eyes not constricted anteriorly; nine antennomeres; mesoventrite without protuberance; elytral punctation in equal series; procoxae with few spine-like setae; metafemoral pubescence extended to more than proximal half; swimming hairs present on meso- and metatarsus; phallobase longer than wide; manubrium wide; parameres knife-shaped.

BIONOMICS: *Anacaena nitens* has been found in splash water pools of about 10 x 10 cm at the border of a waterfall in a primary forest. The individuals fly away very quickly when irritated (personal communication by L. Hendrich).

DISCUSSION: In contrast to GENTILI (1993) the mentum is almost flat (not "excavated").

Anacaena nitens shares several peculiar features with the species of the *A. suturalis*-group (KOMAREK 2005) of the New World, e.g., the elongated, apically attenuate body shape, a serial elytral punctation, swimming hairs on meso- and metatarsus, the presence of procoxal spines (present in at least some species of the *A. suturalis*-group), and the similar aedeagus. These character states, together with the features listed above (see Differential Diagnosis) place this species apart from all other species of *Anacaena* from the Australian Region. These conspicuous morphological differences convinced HEBAUER (2003) to erect a separate genus, *Gentilina*, for this species. HEBAUER (2003) assigned this new genus to Laccobiini, based on two characters (supposed synapomorphies) usually met in this tribe: a very wide pseudepipleuron (in relation to the epipleuron), and the presence of "systematic punctures" (HANSEN 1991). The presence of systematic punctures could not be confirmed in this study. The pseudepipleura are wider and the width ratio pseudepipleura/epipleura is larger than in most species of *Anacaena*, resembling some African species, e.g. *A. angulata* KOMAREK, 2004, *A. foveata* (KOMAREK, 2005), *A. striata* (HANSEN, 1999), *A. sucinea* KOMAREK, 2004. Wide pseudepipleura are also met in the Palearctic *A. globulus* (PAYKULL, 1798). The border between epipleura and pseudepipleura is usually formed as a series of small arcs (HANSEN 1991) in *Laccobius* and most Laccobiini. In *A. nitens* this border is straight, as in all species of *Anacaena*.

DISTRIBUTION: Australia (Q).

Anacaena sublineata (BLACKBURN, 1889), comb.n.

Paracymus (*Paranacaena*) *sublineatus* BLACKBURN 1889: 821.
Paranacaena sublineata: KNISCH 1924: 168; GENTILI 1993: 289.
Paranacaena tasmaniana GENTILI 2002: 88; syn.n.

TYPE LOCALITY: Australia, South Australia, Roseworthy (near Adelaide).

TYPE MATERIAL EXAMINED: ***Paracymus sublineatus***: **Holotype** ♀ (NHM): "T.1935 ♀ [handwritten on mounting card] \ Type [round label] \ Australia / Blackburn Coll. / B.M. 1910-236 \ Paracymus / sublineatus, Blackb. [handwritten] \ ♀ Holotypus / Paranacaena / sublineata Blackb. / E. Gentili 1992".

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Paranacaena tasmaniana: **Holotype** ♂ (ANIC): "Meander R. at Meander / Forest Reserve, TAS / 26. Dec. 1986 L. Hill \ Paranacaena / tasmaniana / HOLOTYPUS \ Paranacaena / tasmaniana m. / E. Gentili 2000 \ [aedeagus mounted separately on a transparent card]". **Paratypes:** 6 exs. (MSNV, ANIC): same sampling data (GENTILI (2002) mentions seven paratype specimens from this locality); 1 ♂ (ANIC): Fish R., 570 m, 28 km SSW Mole Creek, stream bank gravel, 15.X.1985, L. Hill.

ADDITIONAL MATERIAL EXAMINED:

AUSTRALIA: NSW: 2 ♂♂, 3 exs. (FMNH, MSNV): Kosciusko NP, Pipers Creek, NE Guthega, 1340 m, 36°21'S 148°25'E, low wet sclerophyll forest, in algal film at seep on rock face near stream, 14.II.1987, A. Newton & M. Thayer; **V:** 1 ♀ (ISNB): "Ferntree Gully / V.F.E. Wilson / 29.10.33"; 1 ♂ (FMNH): Mt. Buffalo NP, Eurobin Creek, 450 m, 36°43'S 146°50'E, wet sclerophyll forest, wet leaves and flood debris, forest stream, 12.II.1987, A. Newton & M. Thayer "830 FMHD # 87-264 \ Notohydrus n.sp. 3 ♂ ♀ n.sp. 46 / det. M.K. Thayer 1988".

DESCRIPTION: Total length 2.5–2.7 mm; maximum width 1.4–1.5 mm; EI 1.12–1.30. Habitus: distinctly convex, moderately broad, widest at midlength, very slightly attenuate apically. Elytral margins completely visible in dorsal view.

Head: Clypeus and frons entirely black with or without preocular patches. Punctures on clypeus and frons moderately fine, densely and irregularly distributed, interspaces 1–2 x as wide as one puncture. Microsculpture absent. Clypeus about as long as diameter of eye, with blunt anterolateral angles and straight anterior margin, CI=4.2. Eyes distinctly emarginate anteriorly. Antennae composed of eight antennomeres, OI=4.2. Maxillary palpus moderately slender, palpomere 2 weakly inflated, palpomere 3 and 4 dark brown, palpomere 4 without apical infuscation. Mentum flat with straight lateral margins, very slightly impressed anteriorly, anterior margin with slight emargination. Labial palpi large, moderately stout.

Thorax: Prosternum without median carina. Pronotum dark brown to black with narrow, brighter, yellowish lateral margins. Pronotal punctures fine, slightly finer than on frons, with wider distances, interspaces 2–3 x as wide as one puncture. Elytra dark brown to black with very indistinct brighter, rufous, lateral margins and apical portion. Setae absent from lateral borders of pronotum and elytra. Callosity on shoulder regions absent. Anterior elytral declivity distinct. Sutural stria recognisable in posterior 0.7–0.8 of elytra in dorsal view. Punctures on elytra (Fig. 24) moderately coarse, densely distributed, largely unordered, but on some areas tending to form short rows. Punctures with equal distances, interspaces on average as wide as one puncture; coarser lateral punctures absent. Microsculpture absent. Mesoventrite with distinct median protuberance. Procoxae without spine-like setae. Legs dark brown to black like ventrites. Profemur pubescent on proximal two thirds, mesofemur ventrally almost entirely covered with hydrofuge pubescence. Metafemoral pubescence restricted to a very narrow stripe at anterior margin and to proximal portion. Metatarsus almost as long as metatibia.

Aedeagus (Figs. 14–15): Main piece of phallobase about half as long as parameres, wider than long, abruptly narrowing to the spine-like manubrium, distinctly demarcated from phallobase. Parameres plump, lateral margins not sinuate, very slightly curved, widest at base, evenly narrowing towards broadly rounded apex. Median lobe wide at base, evenly narrowing apicad, with a bluntly rounded apex. Median lobe shorter than parameres, corona in subapical position, basal apophyses very short, much less than half as long as main piece of median lobe, wide, with short extension into phallobase. Base of median lobe mesally not visibly connected with parameres.

DIFFERENTIAL DIAGNOSIS: The species has affinities to *A. littoralis*. It differs from this species mainly by the absence of an apical infuscation of the maxillary palpomere 4, by finer pronotal punctures which are less densely arranged than on elytra, by the absence of rows of coarse lateral elytral punctures, and by a larger length ratio metatarsus/metatibia. Both species are clearly distinguishable by aedeagal character states.

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BIONOMICS: This species was found in the algal film on the surface of a rock near a stream, and under wet leaves and flood debris of a forest stream.

DISCUSSION: The body form of this species is rather oblong oval. A "short and broad body" (GENTILI 1993) could not be confirmed here. GENTILI (2002) separates *P. tasmaniana* from *P. sublineata* by dorsal punctation (stronger in *A. tasmaniana*), differences in the phallobase and the median lobe. However, I cannot confirm any differences regarding the aedeagus. The different phallobase is very likely due to a preparation artifact. In the specimens from Tasmania the elytral punctures are slightly less serial and slightly coarser than in the specimens from mainland Australia. This subtle difference can be caused by the geographic separation of the populations from Tasmania, which might represent a separate subspecies, a fact which must be clarified by studying more material. The subtle morphological difference of the elytral punctation does not justify a separate specific rank.

DISTRIBUTION: Australia (NSW, SA, T, V).

Anacaena wattsi (GENTILI, 1993), comb.n.

Paranacaena wattsi GENTILI 1993: 293.

TYPE LOCALITY: Australia, New South Wales, Maclean.

TYPE MATERIAL EXAMINED: **Holotype** ♂ (SAMA): "Maclean / NSW Jan.61 C.W. [handwritten] \ Paranacaena / wattsi n.sp. / Holotypus \ E.Gentili / Paranacaena / wattsi m.". **Paratypes**: **Q:** 1 ex. (MSNV): "A.V. (?) / Blackburn Coll."; **NSW:** 6 exs. (MSNV, SAMA): Windsor, Clarence River, M. Lea (Griffith Coll.); 1 ex. (MSNV): Hawkesbury River, C. Watts, I.1961; 1 ♀ (SAMA): "Alby [=Albury?]", Coll. Blackburn; 1 ♀ (SAMA): Victorian Alps, Griffith Coll.

ADDITIONAL MATERIAL EXAMINED:

AUSTRALIA: NSW: 2 exs. (SAMA): 2 km N Batemans Bay, large shallow swamp, in stamped on grass/sedges at edges, 18.IV.1997, C. Watts [collected together with *A. horni*]; 6 exs. (SAMA): 2 km N Batemans Bay, 2.XI.1997, C. Watts [collected together with *A. horni*]; **NT:** 1 ex. (MSNV): 12.46°S 132.39°E, 12 km NNW of Mt. Cahill, 20.V.1973, E.G. Matthews; **Q:** 2 exs. (SAMA): Mt. Molloy 2 km S, temporary swamp, shallow with emergent grasses and some reeds, recently filled "3 weeks ago", 30.III.1996, C. Watts; 2 exs. (SAMA): Mt. Molloy 5 km NW, permanent swamp, in reeds and grass at edge, 5.II.1997, C. Watts; 1 ex. (SAMA): Greenvale 70 km SW at light, 6.–15.XII.1995, A.J. Watts [collected together with *A. horni*]; 1 ex. (SAMA): Peach Creek, shallow stony creek, some dead leaves, still, at edge of rainforest, 24.VII.1982, C. Watts; **T:** 1 ex. (CLH): Murchinson Hwy, 6 km S Ljandaff, 50 m, 3.II.1998 "Lok.17/68", L. Hendrich; 1 ♂ (CLH): Murchinson Hwy, 5 km N Parawee, 29.I.1998, "Lok.17/58", L. Hendrich; **WA:** 1 ex. (MSNV): Millstream Chichester NP, Fortescue River, RWA [handwritten], 27.XI.74, K.F. Walker; 1 ♂ (CLH): Rockhampton Bruce Hwy, N Ragian, 12 Mile Creek, 14.XI.1996, L. Hendrich.

DESCRIPTION: Total length 1.7–2.1 mm; maximum width 0.9–1.1 mm; EI 1.24–1.34. Habitus (Fig. 5): distinctly convex dorsally, narrow, widest at midlength, attenuate apically, apex narrowly rounded. Lateral elytral margins very slightly inflected, elytra not completely visible in dorsal view.

Head: Clypeus light brown mesally, with brighter areas of variable size laterally, preocular patches present in some individuals; frons light brown. Punctures on clypeus and frons fine, irregular, moderately densely distributed, interspaces 1–3 x as wide as one puncture. Microsculpture absent. Clypeus about as long as diameter of eye, with blunt anterolateral angles and straight anterior margin, CI=4.2. Eyes very slightly emarginate anteriorly, OI=3.7. Antennae composed of eight antennomeres. Maxillary palpus moderately slender, palpomere 2 weakly inflated, palpomere 4 with infuscation, or infuscation absent. Mentum excavate centrally, sexually dimorphic: a sharp, longitudinal mesal furrow present in males, a very shallow excavation in females; some female individuals with almost flat mentum. Punctures present on

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ventral face of mentum; microsculpture absent; lateral margins straight, anterior edge not emarginate. Labial palpi moderately stout, palpomere 3 slightly elongate.

Thorax: Pronotum largely light brown with very indistinctly darker central area. Pronotal punctures very fine, widely spaced. Prosternum with median carina in anterior third. Elytra light brown, very indistinctly darker brown areas present in most individuals. Setae absent from lateral borders of pronotum and elytra. Callosity on shoulder regions absent. Anterior elytral declivity distinct. Sutural stria recognisable in posterior 0.7 of elytra in dorsal view. Punctures on elytra very fine, with subserial distribution, rather widely spaced, interspaces on average more than 4 x as wide as one puncture, primary and secondary rows present; slightly coarser punctures present near lateral margins. Microsculpture absent. Mesoventrite with distinct median protuberance. Procoxae without spine-like setae. Legs and ventrites darker brown than elytra. Pro- and mesofemur ventrally almost entirely covered with hydrofuge pubescence, metafemoral pubescence restricted to a very narrow strip at anterior margin and to proximal portion. Metatarsus slightly shorter than metatibia.

Aedeagus: (Figs. 16, 17): Main piece of phallobase less than half as long as parameres, about as wide as long, narrowing to distinctly demarcated manubrium; manubrium with spine-like extension. Parameres slender, with almost straight lateral and mesal margins, widest at base, evenly narrowing towards broadly rounded, weakly sclerotized apex. Median lobe very slender, almost parallel-sided, with bluntly rounded apex; shorter than parameres, with corona in apical position; basal apophyses long, rather slender, with distinct extension into phallobase. Base of median lobe mesally visibly connected with parameres.

DIFFERENTIAL DIAGNOSIS: This species is very similar to *A. horni*, from which it can be distinguished mainly by the following features: body shape less wide, elytral color paler, elytral punctures finer, mentum excavate, punctures on mentum stronger, shape of aedeagus different.

BIONOMICS: This species has been collected in a stony creek in a rainforest, and in swamps with grass, sedges, reeds, among dead leaves. It was also collected at artificial light sources.

DISCUSSION: GENTILI (1993) pointed out the strong affinities between *A. wattsi* and *A. horni*. The morphological differences mentioned in the original description of *A. wattsi* can be confirmed, except for the difference in the length of the maxillary palpomere 2. The differences in the morphology of the mentum (excavate in *A. wattsi*, flat in *A. horni*) and the different aedeagus justify a separate specific status for *A. wattsi*.

DISTRIBUTION: Australia (NSW, NT, Q, T, WA).

Key to the species of *Anacaena* from Australia

1	Mesoventrite without protuberance; metafemoral pubescence extended on more than proximal half; procoxae with a few spine-like setae; eyes not constricted anteriorly; elytral punctures arranged in equal series (Fig. 25); nine antennomeres; phallobase longer than wide; manubrium wide; parameres knife-shaped (Fig. 18).	***nitens***
-	Mesoventrite with distinct protuberance; metafemoral pubescence restricted to anterior margin and a small proximal portion; procoxae without spine-like setae; eyes slightly or strongly constricted anteriorly; elytral punctures unordered, or with primary and secondary series, or serial punctures alternating with unordered punctures (Figs. 20–24); eight antennomeres; phallobase not longer than wide; manubrium extended into a long spine; parameres not knife-shaped (Figs. 6–17).	**2**
2	Elytral punctation arranged in primary and secondary rows (Figs. 20, 21).	**3**
-	Elytral punctation not arranged in primary and secondary rows (Figs. 22–24).	**6**

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3 Pronotum dark brown with narrow light brown or yellowish lateral margins; most parts of elytra dark brown to black; lateral elytral margins not flexed mesad, elytra therefore entirely visible in dorsal view. **4**

- Pronotum light brown with or without dark central area; most parts of elytra light brown; lateral elytral margins flexed mesad, elytra therefore not entirely visible in dorsal view. **5**

4 Ventral face of mentum with central impression, microsculpture present. ..... ***eremita***

- Ventral face of mentum without central impression, microsculpture absent..... ***eremitoides***

5 Prosternum with a very short median carina in anterior third; pronotal and elytral punctures almost equally strong; basal portion of parameres less than 2 x as wide as apical portion (Figs. 16, 17). ..... ***wattsi***

- Prosternal carina completely absent; punctures on pronotum finer than on elytra; basal portion of parameres more than 2 x as wide as apical portion (Figs. 10, 11)..... ***horni***

6 Elytral disc with distinct rows of punctures among irregular punctation. Parameres slender (Figs. 10, 11)..... ***lindi***

- Elytral disc with irregular punctation; rows of punctures absent or very indistinct. Parameres wide (Figs. 12–15). *7*

7 Maxillary palpomere 4 not infuscated; pronotal punctures fine; elytra with short series of punctures along lateral margins; punctures on elytra stronger than on pronotum; apophyses shorter than main piece of median lobe (Figs. 14, 15). ..... ***sublineata***

- Maxillary palpomere 4 infuscated; pronotal punctures moderately sized; elytra without series of punctures along lateral margins; punctures on elytra and on pronotum approximately equally strong; apophyses as long as main piece of median lobe (Figs. 12, 13). ..... ***littoralis***

Discussion

All species described herein are endemic to Australia. One species (*A. nitens*) shows morphological affinities with species of the *A. suturalis*-group of the New World. Some of the other species share several character states with species from New Guinea and from New Caledonia (elytral punctures arranged in serial rows, spine-like extension of manubrium). All the species described share apomorphic features with the species of *Anacaena* (KOMAREK & BEUTEL 2006). It is therefore justified to transfer them from *Paranacaena* to *Anacaena*. All species of *Anacaena* from Australia are to be considered aquatic.

Zusammenfassung

Die Arten der Gattung *Paranacaena* von Australien und Tasmanien werden revidiert. *Paranacaena tasmaniana* (GENTILI, 2002) wird mit *Paranacaena sublineata* (BLACKBURN, 1889) und *Paranacaena hibrida* (GENTILI, 2002) mit *Paranacaena littoralis* (d'ORCHYMONT, 1942) synonymisiert. Alle derzeit bekannten Arten werden wiederbeschrieben. Eine neue Art, *Anacaena eremitoides*, wird beschrieben. Alle australischen *Paranacaena*-Arten werden formell zur Gattung *Anacaena* transferiert.

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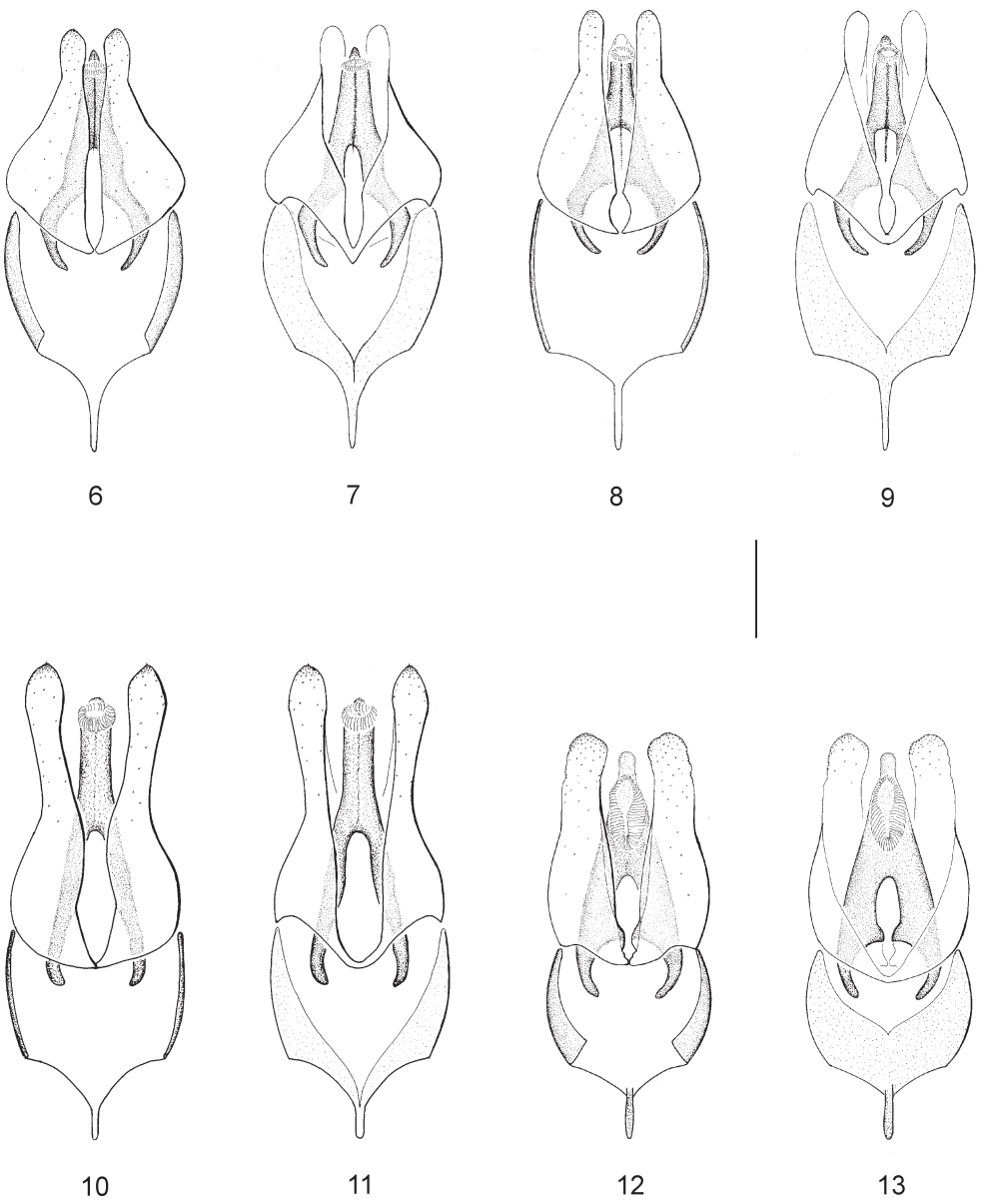

Figs. 6–13: Aedeagus: 6, 8, 10, 12: dorsal view, 7, 9, 11, 13: ventral view, 6–7) *Anacaena eremita*, 8–9) *A. eremitoides*, 10–11) *A. lindi*, 12–13) *A. littoralis*. Scale bar = 0.1 mm.

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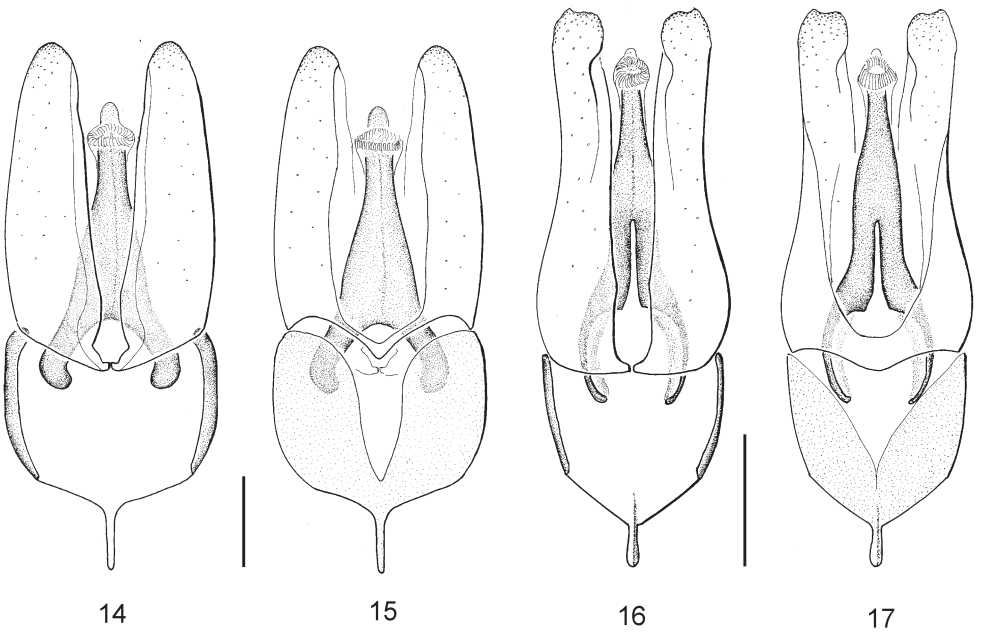

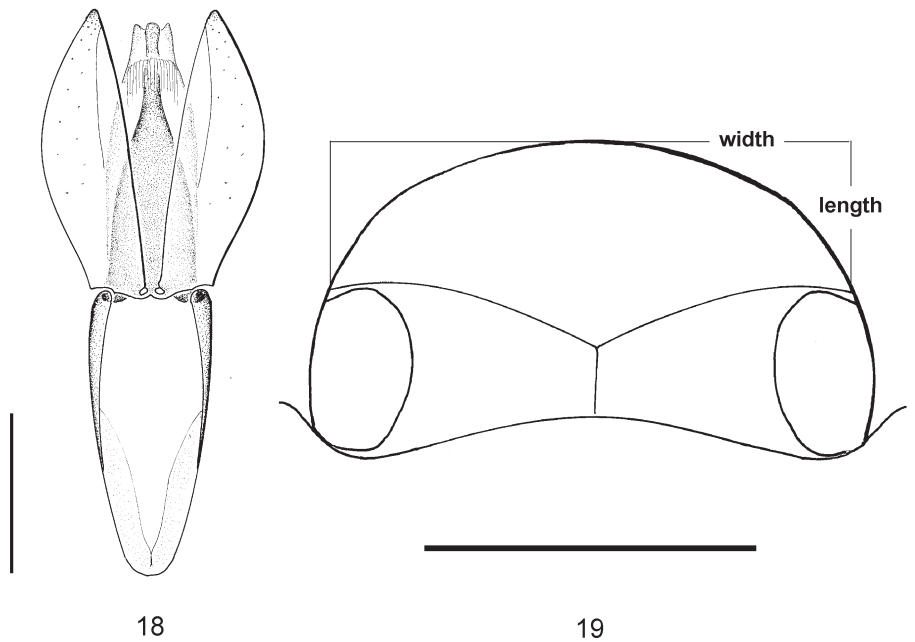

Figs. 14–18: Aedeagus: 14, 16: dorsal view, 15, 17: ventral view, 14, 15) *Anacaena sublineata*, 16, 17) *A. wattsi*, 18) *A. nitens*. Scale bar = 0.1 mm.

Fig. 19: Clypeus of *Anacaena horni*. Scale bar = 0.5 mm.

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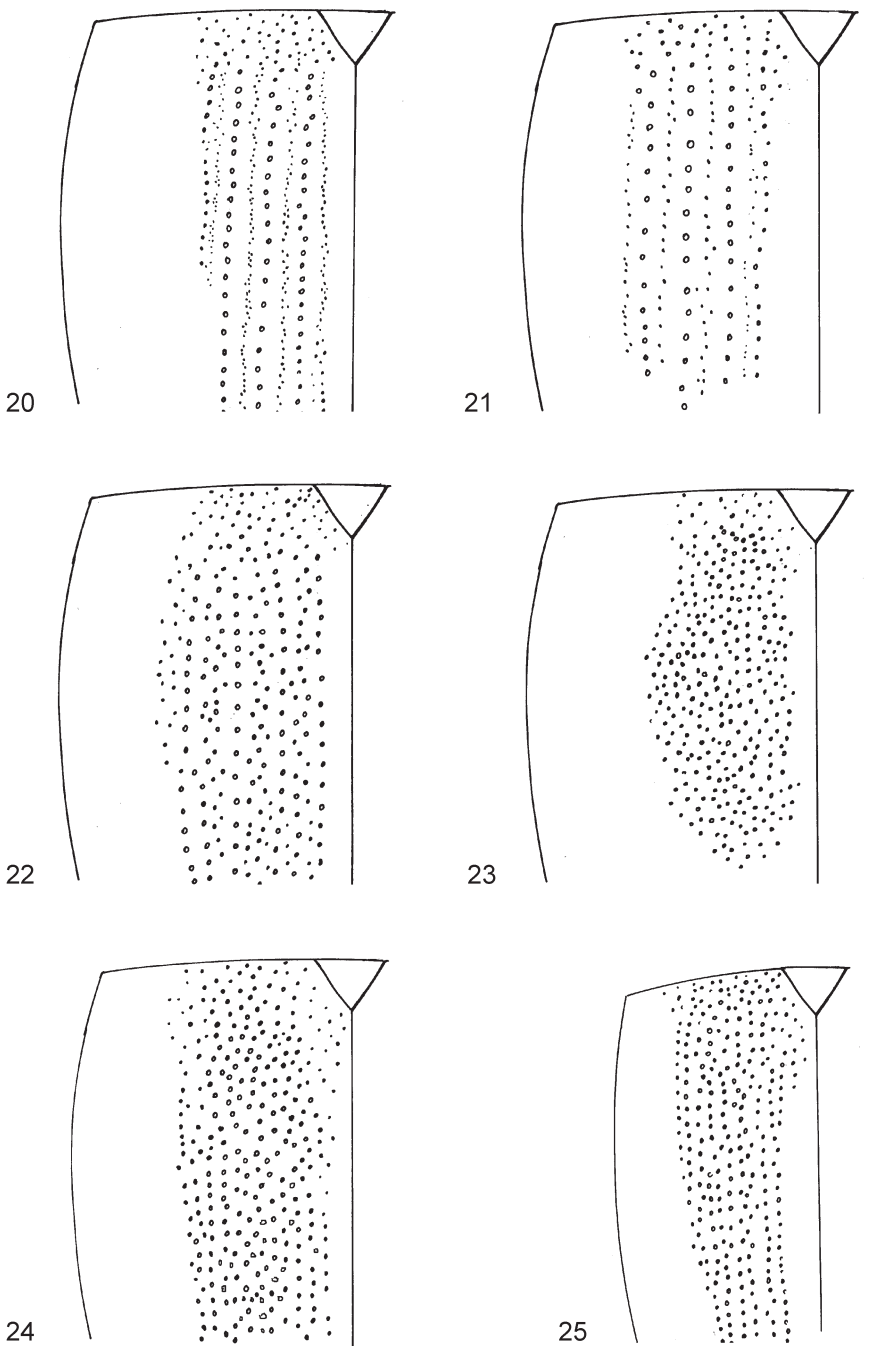

Figs. 20–25: Arrangement of elytral punctures: 20) *Anacaena eremita,* 21) *A. horni*, 22) *A. lindi*, 23) *A. littoralis*, 24) *A. sublineata*, 25) *A. nitens.*

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