

Entomofauna of Vanikoro (Solomon Islands) Part 1. Introduction and Coleoptera: Buprestidae

Svatopluk Bílý¹⁾, Gianfranco Curletti²⁾ & Henri-Pierre Aberlenc³⁾

¹⁾Department of Entomology, National Museum, Kunratice 1, CZ-14800 Praha 4, Czech Republic
e-mail: Svatopluk_Bily@nm.cz

²⁾Museo Civico di Storia Naturale, Parco Cascina Vigna, I-10022 Carmagnola, Italy
e-mail: giancurletti@tiscali.it

³⁾Umr CBGP, CIRAD, Campus de Baillarguet (CSIRO), F-34398 Montpellier Cedex 5, France
e-mail: henri-pierre.aberlenc@cirad.fr

Abstract. Entomological collections were made in November 2003 and May 2005 during a French archaeological expeditions to Vanikoro (Solomon Islands) in search of evidence on land and sea for what happened to Lapérouse (1785-1788). The geography, geology, climate and vegetation types of Vanikoro are briefly presented along with a summary of collections made. Among the Buprestidae, the subject of this paper, *Maoraxia bourgeoisi* **sp. nov.** and *Agrilus (Agrilus) funebris vanikorensis* **subsp. nov.** from Vanikoro are described, illustrated and compared with related species. Occurrence of five other buprestid beetles from this island are commented and the biotopes in which they were collected are briefly described.

Taxonomy, new species, new subspecies, synonymy, Coleoptera, Buprestidae, Solomon Islands, Australian region

Introduction

The 2003 and 2005 French archaeological expeditions in Vanikoro [= Vanikolo] (the Solomon Islands) was organized by the Association Salomon (from Nouméa, New Caledonia), the French Navy, the IRD (Institut de Recherche pour le Développement) and the DRASSM (Département des Recherches archéologiques subaquatiques et sous-marines). The purpose was to excavate the survivors' camp and two ship wrecks of the Lapérouse expedition (1785-1788) to uncover the tragic end of one of the greatest scientific expeditions of the 18th century. These expeditions included also an entomologist (H.-P. Aberlenc).

On Vanikoro, near the village of Payou [= Paeu] and nearby mountain slopes collections were made of Insecta (Coleoptera, Lepidoptera, Diptera, Hymenoptera, Neuroptera, Hemiptera, Orthoptera, Dermaptera, Dictyoptera) and a few Collembola, Arachnida (Spiders, Acari, Scorpiones, Schizomida), Myriapoda and Crustacea. Other contributions will be published on the Vanikoro entomofauna, particularly on the Orthoptera, Elateridae, Tenebrionidae, Cerambycidae, Scarabaeidae, etc. Specimens are preserved in CIRAD, Umr CBGP, or dispatched to several specialists and Museums.

The entomofauna of Vanikoro, and more generally the Solomon Islands is partly described. While surviving naturalists of Lapérouse may have collected insect specimens that remain lost, the naturalists, Drs Quoy and Gaimard, of the Dumont d'Urville expedition (1826-1829), collected the first known insects on Vanikoro in 1828. These historic specimens are preserved in the Muséum national d'Histoire naturelle, Paris (Berland, 1932; Boisduval, 1835). Since then, P. François collected insects (preserved in MNHN) and arachnids on Vanikoro (Simon, 1898) and R. J. A. Lever collected Orthoptera and Phasmatodea in the

early 20th century (Günther, 1937). From 1923 to 1926 N. S. Hefferman, the Santa Cruz District Officer staying in Patau, collected insects and sent them to the Australian Museum, while the Troughton and Livingston expedition made independent collections in 1926 in the Santa Cruz Islands for the Australian Museum (A. de Biran, pers. com.). Tennent (2002) published studies and a book on the butterflies of the Solomon Islands.

Nine species of buprestid beetles were collected on the 2003 and 2005 expeditions by hand collection or using yellow or blue sticky traps, Malaise and light traps. All species collected are listed along with short distributional information. These studies led to the discovery of a new species of the genus *Maoraxia* Obenberger, 1937 and a new subspecies of the genus *Agrilus* Curtis, 1825 which are described below. The collected material was determined accordingly to the relevant descriptions and by comparing specimens with the specimens in the collections of J. Obenberger (NMPC) and MNHN or by comparing specimens with the type material (*Agrilus vestitus* Deyrolle, 1864, MNHN).

The following acronyms are used in the text:

CIRAD Centre de Coopération internationale en Recherche agronomique pour le Développement, Montpellier, France;

MNHN Muséum national d'Histoire naturelle, Paris, France;

MCCI Museo Civico di Storia Naturale, Carmagnola, Italy;

NMPC National Museum, Prague, Czech Republic;

VHPA codents of samples collected by H.-P. Aberlenc.

Vanikoro Island

(Fig. 1)

Geography. Vanikoro is a South-Pacific island that is part of the Santa Cruz archipelago of small islands in Temotu Province at the extreme South-East of Solomon Islands, close to the Northern Vanuatu. It is approximately 24 km east-west and 15 km north-south. It is surrounded by a coral reef except on the east side. The highest point, Mount Popokia, is 800 m above sea level (most texts list it as more than 900 m).

Geology. Vanikoro is a Pliocene island approximately five million years old (Mueller-Dombois & Fosberg, 1998). Vanikoro is made of steeply volcanic slopes of basaltic rocks, surrounded by a more or less flat or with gently sloping fertile littoral plain made of littoral and alluvial deposits, with a calcareous coral reef ring (Dennis, 1981). The island does experience earthquakes.

Climate. Vanikoro is in the high rainfall equatorial zone. At Patau, which is at sea level, the average annual rainfall is 5598 mm, and the annual mean air temperature is 27.5°C (Mueller-Dombois & Fosberg, 1998). The rainfall on Mount Popokia keeps the summit in almost continuous cloud and possibly reaches about 7000 mm (Hallé, 2003)! Cyclone activity is frequent.

Vegetation. Hallé (2003) distinguishes seven kinds of vegetation in Vanikoro, which we have simplified here with respect to the entomological requirements:

- 1 – mangroves, not everywhere along the Vanikoro littoral (few insects collected using one Malaise trap);
- 2 – littoral vegetation, on the coastal plane, a secondary more or less open and low vegetation associated with the coastal rain forest (many insects collected);
- 3 – coastal plane rainforest, secondary vegetation occasionally flooded (insects collected especially along the banks of the Lawrence river);

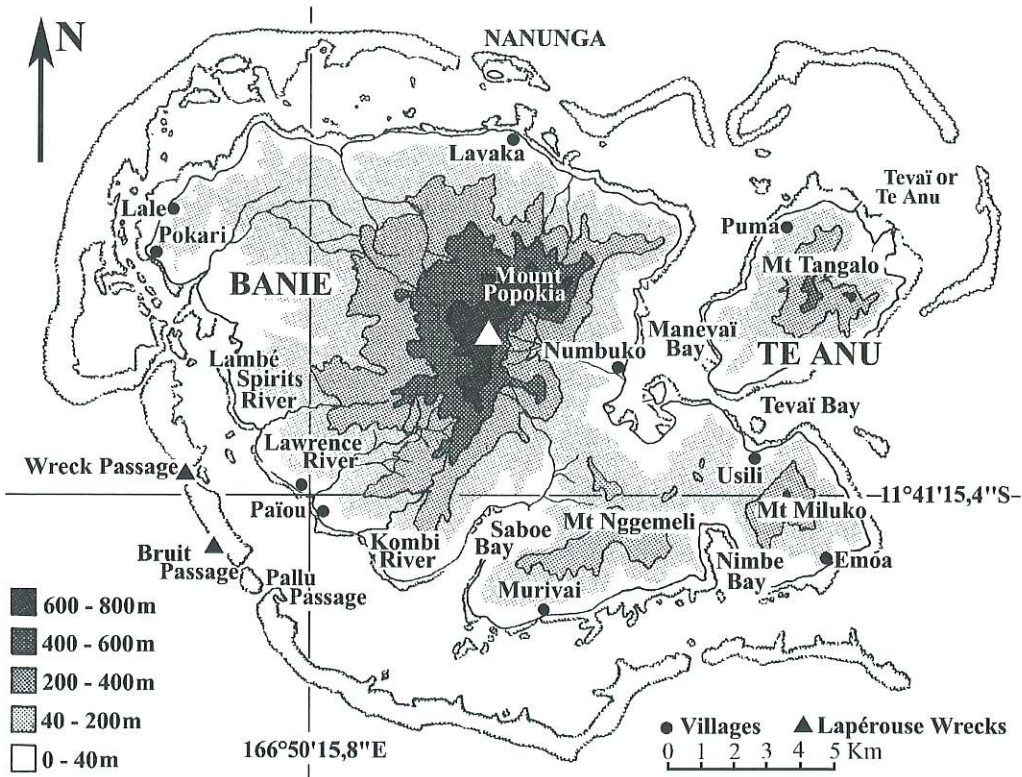


Fig. 1. A map of the Vanikoro Island.

- 4 – village gardens, on the coastal plane close to the coastal villages. cultivated cropping areas replacing the littoral vegetation or the coastal rain forest (many insects collected particularly at the border between garden and rain forest and from cleared areas with dead or dying wood);
- 5 – slope rainforest, rainfall increasing with altitude; canopies up to 40 m. Thick litter layer, especially in the ravines. Exploited heavily by the Kaury Timber Company to extract kaury, *Agathis macrophylla* (Araucariaceae) timber from 1923 to 1964, but having shown good recovery in the last 40 years, back to more or less “primary-like” rainforest again as little spoilt by the native villagers.
- 6 – This habitat merges progressively into wet montane rainforest (canopy height ca. 20 m) at approximately 400 m asl (many insects collected between 145 to 410 m asl. on a watershed).

Taxonomy

Maoraxia bourgeoisi sp. nov.

(Figs 2-4)

Type locality: “Solomon Islands, Vanikoro Island, 11° 39' 45.6" S – 166° 51' 45.9" E (410 m)”.

Type material. Holotype (♀). Solomon Islands, Vanikoro Is., 11.-24. xi. 2003, H.-P. Aberlenc leg., Malaise trap, VHPA 188. Paratypes (5 ♀♀). The same data as holotype except yellow sticky trap, VHPA 189 (4 ♀♀) and Solomon Islands, Vanikoro Is., forest behind Payou village, close to the ruins of the District Officer house, 8.-28. xi. 2003, H.-P. Aberlenc leg., Malaise trap, VHPA 220 (1 ♀). Holotype deposited in NMPC, paratypes in CIRAD, MNHN, MCCI and NMPC.

Holotype description. Small, oval, weakly convex, entire dorsal surface (incl. head) covered with rather long, semi-erect grey pubescence; frons black with slight greenish-violet tinge, pronotum and elytra dark metallic-green, lateral margins and suture of the latter with slight blue-violet reflections; scutellum golden-red, antennae black, legs metallic green dorsally and black ventrally, tarsomeres 3 + 4 testaceous; ventral side black with very slight green reflections and with short, white, semi-erect pubescence.

Head small, frons strongly convex (Fig. 2), eyes elliptical, slightly projecting beyond outline of head; fronto-clypeal suture as figured (Fig. 4); sculpture of head homogeneous, consisting of small, simple punctures; vertex about 1.8 times as wide as width of eye; antennae long and slender, serrate from antennomere 4, reaching nearly first third of elytral length; first antennomere 3 times as long as wide, slightly claviform, second antennomere twice as long as wide, third antennomere very small and slender, twice as long as wide (the smallest of all antennomeres); antennomeres 4–10 strongly serrate, about twice as long as wide getting gradually slightly shorter towards the terminal antennomere which is elongate, sub-elliptical.

Pronotum much narrower than elytra, 1.9 times as wide as long (Fig. 2); both anterior and posterior margins slightly bisinuose, lateral margins nearly regularly rounded and distinctly concave before posterior angles; disc of pronotum moderately and regularly convex, posterior angles flattened; lateral pronotal carina sharp, complete, slightly S-shaped; pronotal sculpture consisting of very fine, simple punctures, space between them lustrous, not chagrened. Scutellum small, cordiform, somewhat longer than wide.

Elytra short, slightly convex on disc and somewhat flattened at humeral part, 1.5 times as long as wide, the widest part at posterior two thirds (Fig. 2); humeral swellings small but well developed, basal elytral depressions not developed; epipleuras far not reaching elytral apex, each elytron obtusely, separately rounded apically; elytral sculpture of the same type as that on pronotum but distinctly rougher.

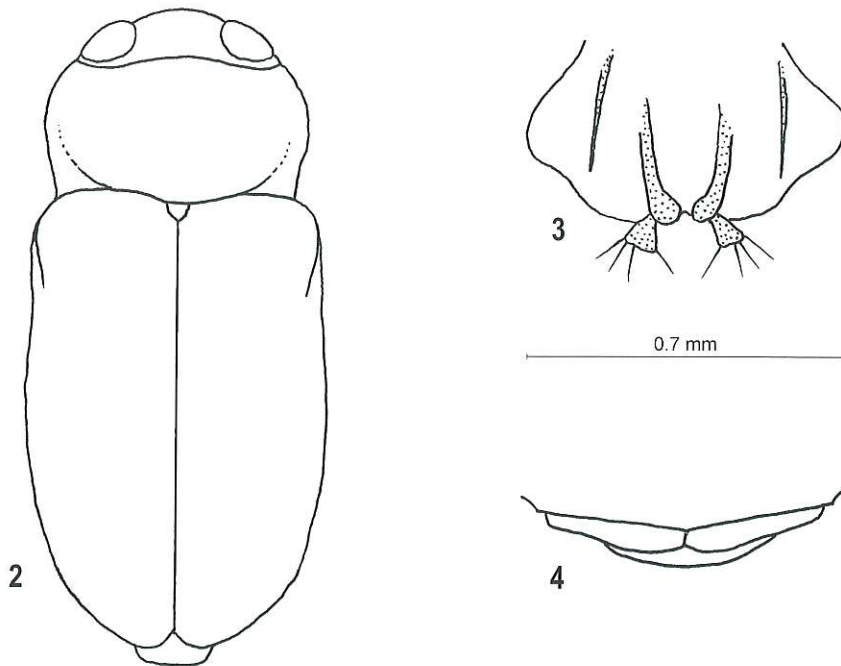
Ventral side densely and finely punctate, anal ventrite simply rounded and very finely margined posteriorly; prosternal process tapering posteriorly, obtusely acumined apically, laterally distinctly margined and nearly completely dividing mesosternum. Legs long and slender, metatibiae slightly bent inwards; tarsi long, basal segment as long as the rest of tarsus, adhesive pads developed only on tarsomere 4. Claws small, strongly enlarged at base.

Ovipositor (Fig. 3) short, apodemes and styli rather strongly sclerotized.

Holotype length: 3.7 mm; width: 1.7 mm.

Variability of paratypes. There is no significant variability in coloration of paratypes. Lateral pronotal margins of two paratypes are more deeply incurved before posterior angles than those in holotype, while one paratype possesses nearly unincurved lateral pronotal margins. Pronotum 1.8–1.9 times as wide as long, elytra 1.4–1.5 times as long as wide. Length of paratypes: 3.4–4.2 mm, width: 1.6–1.9 mm.

Differential diagnosis. *Maoraxia bourgeoisi* sp. nov. differs from all other species of the genus by strongly convex frons and very short elytra which are 1.8–2.0 times as long as wide in all so far known species (Bellamy & Williams, 1985). The last revision of the genus *Maoraxia* Obenberger, 1937 was published by Bellamy & Williams (1985) and completed by Bellamy (1991). In the both papers the possibility of a discovery of undescribed species in the Solomon Islands was indicated. By its very narrow pronotum, *M. bourgeoisi* sp. nov. stands close to *M. eremita* (White, 1846) from New Zealand but except for characters given above it differs also by much finer puncturation, coloration, lustrous body and smaller size (see Bellamy & Williams, 1985). Following the key of *Maoraxia*



Figs 2-4. *Maoraxia bourgeoisi* sp. nov. 2 – female, holotype, 3.7 mm; 3 – apex of ovipositor; 4 – frontoclypeal suture.

species (Bellamy, 1991), *M. bourgeoisi* sp. nov. could be placed just after the couplet 4(3) of the key; the number of *Maoraxia* species has now increased up to 9 species.

Collecting conditions. Collected in little glades in the slope rainforest and in the mountain forest, both by yellow sticky traps and by Malaise traps. VHPA 188 and VHPA 189 were collected in the slope/low montane rainforest, while VHPA 220 was collected on the first slopes. Five specimens (not included among paratypes) in may 2005, in a glade in the coastal rainforest in Lambé, yellow sticky traps, VHPA 295.

Etymology. Kindly dedicated to the Bourgeois brothers: Yves Bourgeois (chief of ATOM Agency, who filmed in Vanikoro for the TV programme “Sur les traces de Lapérouse. Portés disparus” and “Le secret des déferlantes” and invited H.-P. Aberlenc) and Dr Hugues Bourgeois (the expedition’s doctor, who assisted in collections).

Chrysodema radians radians (Guérin-Ménéville, 1830)

Buprestis radians Guérin-Ménéville, 1830: 63-64.

Type locality: Port Praslin, Nouvelle Irlande [Tombara, PNG].

Specimens examined. “Solomon Islands, Vanikoro Is., unknown exact place and date, local collector, VHPA 086” (6 ex.).

The coloration of dried pinned specimens is metallic green with golden iridescence and two large orange spots on the pronotum, although in the humid atmosphere of Vanikoro were rather metallic copper-red colored.



Figs 5-6. *Agrilus (Agrilus) funebris vanikorensis* subsp. nov. 5 – male, holotype, 4.0 mm; 6 – female, paratype, 4.4 mm.

Distribution. Accordingly to the recent revision of the genus (Lander, 2003), this subspecies is widely distributed across all Indonesian Islands reaching eastern Papua New Guinea, Solomon Islands and Northern Queensland (Cape York). All specimens collected belong to the form which was described as a separate species *C. aurofoveata* (Guérin-Méneville, 1830) and which was synonymised with *C. radians radians* by Lander (2003) as a variety *aurofoveata*.

***Paracupta helopoides* (Boisduval, 1835)**

Buprestis helopoides Boisduval, 1835: 79, tab. 6, fig. 5.

Type locality: Vanikoro.

Specimens examined. "Solomon Islands, Vanikoro Is., Poyou village (close to the sea level), 2. xi. 2003, unknown local collector, VHPA 026" (1 ex.).

Distribution. Solomon Islands, Vanuatu.

Obenberger (1928) described from the Solomon Islands after a single specimen *P. helopoides antennata* Obenberger, 1928 on the base of a different coloration of basal antennomere and elytral grooves. After having studied the holotype of *P. helopoides antennata* (NMPC) and comparing it with the rich material of *P. helopoides* from the Solomon Islands and Vanuatu (former New Hebrides) we have failed to find any significant difference but without a detailed study of the type specimens of *P. helopoides helopoides* we are unable to synonymize both forms.

***Paracupta xanthocera* (Boisduval, 1835)**

Buprestis xanthocera Boisduval, 1835: 79, tab. 6, fig. 4

Type locality: Vanikoro.

Specimens examined. "Solomon Islands, Vanikoro Is., near Poyou village, 11°41'13.0"S – 166°50'17.1"E (close to the sea level), 6. xi. 2003, Malaise trap, H.-P. Aberlenc leg., VHPA 055" (1 ex.).

Collecting conditions. The Malaise trap was situated in an area of gardens close to the coastal plane rainforest, where trees were recently cut for new crop plantations; a place with many stumps, dead tree trunks and branches, sometimes partly burned.

Distribution. Papua New Guinea, Indonesia (North Maluku Isls: Halmahera, Seram, Ambon), Solomon Islands.

***Paracupta hebridana* Obenberger, 1916**

Paracupta hebridana Obenberger, 1916: 29.

Specimen examined. Poyou, 7. V. 2005, VHPA 292.

Collecting conditions. Unknown local collector.

Distribution. Solomon Islands, Vanuatu.

***Paracupta* sp.**

Paracupta Deyrolle, 1865: 33.

Specimens examined. "Solomon Islands, Vanikoro Is., Poyou village, XI. 2003, H. P. Aberlenc leg." (1 ex.).

The specimen (♀) is rather similar to *P. xanthocera* (Boisduval, 1835) differing from it by less developed pronotal grooves and depressions and by deeper elytral striae.

***Chrysobothris aruensis* Deyrolle, 1864**

Chrysobothris aruensis Deyrolle, 1864: 111.

Specimen examined. Poyou, I. V. 2005, H.-P. Aberlenc leg., VHPA 263.



Fig. 7. A biotope of *Agrilus funebris vanikorensis* **subsp. nov.** near Payou.

Collecting conditions. Walking on a dead tree trunk.

Distribution. Moluccas, Aru and Kai [or Kei] Islands; Solomon Islands, Tulaghi, Vanikoro; Vanuatu, Epi, Mount Savieh.

Agrilus (Agrilus) vestitus Deyrolle, 1864

Agrilus vestitus Deyrolle, 1864: 154

Type locality: Ambon [Indonesia, N Maluku].

Specimens examined. "Vanikoro Is., near Payou village, xi.2003 and v.2005; Pokari and Lambé, v.2005, H.-P. Aberlenc leg." More than one hundred specimens.

Collecting conditions. In an area of garden close to the coastal plane rain crop plantations; a place with many stumps, dead tree trunks and branches, sometimes partly burned. Many specimens collected by yellow sticky traps, some specimens by blue sticky traps, on dead branches. Also some specimens attracted in the night by the U.V. light trap: 13.xi. (2 ex.), 14.xi. (2 ex.), 15.xi. (1 ex.), 16.xi. (1 ex.), 18.xi. (1 ex.), 19.xi. (14 ex.), 20.xi. (2 ex.), 21.xi. (3 ex.), and 25.xi. 2003 (1 ex.), 29.iv.2005 (1 ex.) and 8.v.2005 (1 ex.).

Distribution. Described from Ambon, this species is known from Moluccas, New Guinea, and Solomon Is. (Curletti, in press).

As already stated (Curletti, 2003), we have never found any morphological differences with *Agrilus ornatus* Deyrolle, 1864, that is distinguishable only from the elytral pubescence. The long series of specimens found during this expedition, by studying the aedeagus confirmed this observation. The sympatry of these two species together with presence in Vanikoro Is. of *A. vestitus* only, seems strengthen hypothesis that there are two forms of one species only. If this opinion will be confirmed in the future, *A. ornatus* will fall in synonymy of *A. vestitus*.

Agrilus (Agrilus) funebris vanikorensis subsp. nov.

(Figs 5-6)

Type locality: Solomon Islands, Vanikoro Island, Payou village, 11°41'13.0"S 166°50'17.1"E.

Type material. Holotype (♂). "Solomon Isl., Vanikoro, Payou village, xi. 2003, H.-P. Aberlenc leg." (MNHN) (Fig. 5). Paratypes (10 ♀♀). The same data (MCCI, CIRAD, NMPC) (Fig. 6). Ten other specimens in Payou and Lambé, v.2005, collected by yellow sticky traps, H.-P. Aberlenc leg.

It differs from *Agrilus funebris funebris* Deyrolle, 1864 (type locality: Arrow Is., PNG) by having in average smaller dimensions in length (holotype length: 4.0 mm; from 4.0 to 5.0 mm in the paratypes, 4.7-5.0 mm in *A. funebris funebris*), more bronze coloration; the male has metatarsus with first metatarsomere longer than the sum of following three ($1 = 2 + 3 + 4$ in *A. funebris funebris*), and anterior claws mucronate (bifid in *A. funebris funebris*); the female has a glabrous transversal stripe at $\frac{3}{4}$ of length absent or less evident (Fig. 6).

This subspecies is probably endemic of the Santa Cruz group, archipelago of small islands at the extreme South-East of Solomon Islands, close to the Northern Vanuatu.

Collecting conditions. In an area of gardens close to the coastal plane rain-forest, where trees were recently cut for new crop plantations (Fig. 7); with many specimens of *A. vestitus*.

Etymology. This name is derived from the French name Vanikoro, used for the island since the Dumont d'Urville expedition (1828).

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