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Rediscovery of *Aulacocyclus andrewesi* Gravely, 1914, endemic of the southwestern Indian Peninsula (Coleoptera, Passalidae)

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Abstract. – *Aulacocyclus andrewesi* Gravely, 1914, previously known by the unique type from the southwestern Indian Peninsula, Anamalai Hills, is newly observed and illustrated on specimens from the Nilghiri Hills, mountain rainforest at 1100 m. The species is endemic of the Western Ghats and the only one Aulacocyclinae living in the Peninsula, south of the Himalayas. *A. andrewesi* represents a faunal relict and is possibly allied to the species group of *A. parryi* Kaup, 1871, and *A. felderi* Stoliczka, 1873, from the Great Sunda Islands up to Melanesia.

Résumé. – **Redécouverte d'*Aulacocyclus andrewesi* Gravely, 1914, endémique du sud-ouest de la péninsule Indienne (Coleoptera, Passalidae)**. *Aulacocyclus andrewesi* Gravely, 1914, auparavant connu par le type unique du sud-ouest de la péninsule Indienne, Anamalai Hills, est à nouveau examiné et illustré sur des spécimens des Nilghiri Hills, forêt humide de montagne à 1100 m. L'espèce est endémique des Ghats Occidentaux et est le seul Aulacocyclinae habitant la péninsule, au sud de l'Himalaya. *A. andrewesi* représente une faune relicte et est peut-être affilié au groupe d'espèces de *A. parryi* Kaup, 1871, et *A. felderi* Stoliczka, 1873, répandu depuis les îles de la Sonde jusqu'en Mélanésie.

Keywords. – Aulacocyclinae, systematics, Western Ghats, India.

As part of the rarest and little known species of Passalidae Aulacocyclinae, is *Aulacocyclus andrewesi* Gravely, 1914. The species was described on a single specimen, sex unknown, from collecting by H. E. Andrewes in the Western Ghats, Indian Peninsula, Anamalai Hills, mountain rainforest, 1150-1300 m, in rotting log. Andrewes was a specialist of Carabidae and he collected many insects in these mountains, mainly during the 1910's. Since then, *A. andrewesi* was not found again, and I was unable to see any other specimen among numerous old or recent collections. The species is not cited by Gravely (1918) himself, although he considered the distribution of Aulacocyclinae in the Indian Peninsula. The description is concise. The head with antennae and the anterior part of the pronotum are figured in small size and not very precise engraving. Dibb (1935) examined the type, but without giving descriptive characters. Arrow (1950) also examined the type, and made a diagnosis, not illustrated, contrary to other passalids in his *Fauna*. Afterwards, it seems that no specialist has seen the species, but H. W. Hincks in the 1950's, as it is shown by the numerous passalids he examined these years in the Natural History Museum, London (NHM), and no further relevant mention is found in the literature.

Gravely and Arrow raised some remarks on the general morphology of *A. andrewesi*, compared with other species of the genus. With regard to the endemism, Gravely (1914) observed that the occurrence of an *Aulacocyclus* Kaup, 1868, in the Indian Peninsula was showing the discontinuous distribution of the genus. A fact which could determine that Aulacocyclinae « *were once more abundant, more widely distributed towards the west than they are now* ». Dibb (1935) indicates that « *... this isolated example is peculiar in occurring so much further north than any other species of* Aulacocyclus ». Arrow (1950) summarized by « *a remarkable and isolated species, the nearest allies of which are found in Australia and the Papuan Region* ». These ideas are certainly accurate, except some details, as from Dibb about the localization, and from Arrow about the phylogenetic affinities.

The rediscovery of *A. andrewesi* is interesting relatively to the renewed interpretation of its systematics and endemism. It is an occasion for completing, sometimes correcting, in my view, the described characters by Gravely or Arrow. However, these authors have made fine observations, and it is using here, when useful, the same terms as much as citations.

Terminology. – The used terminology, especially for the head capsule and mandibles, is that revisited or established by BOUCHER (2006). Other terminology is basically found in GRAVELY (1914, 1918).

Material examined. – The type, in the NHM, is a mature stage in good condition, except that the right mandible is missing, as already stated GRAVELY (1914). A while ago I had the opportunity to study five other specimens (2 ♂, 3 ♀), all young mature stages, from southwestern India, Nilghiri Hills (no other precision), 1100 m, in rotting log, XI.2002. Without doubt this series came from one family group.

Aulacocyclus andrewesi Gravely, 1914

Aulacocyclus andrewesi Gravely, 1914: 211.

Completed description. – Habitus a few slender, elongated, subparallel, glabrous and slightly flattened. Macropterous; hindwing with normal venation of Aulacocyclinae. Total length, from anterior border of clypeus to the apex of elytra: 20.7-23.7 mm. Greatest width: 7.3-8.2 mm over elytra.

Head (fig. 1) smooth and glabrous. Central tubercle elevated, firstly vertical and narrow, then horizontal, short, directed forward, enlarged in front; superior crest with free and bifid apex. Antero- and postero-frontal ridges, tentorial tubercles, lateroposterior and inner tubercles totally regressed. Epicranial suture marked, reaching the distal part of the laterofrontal area. Anterior margin of the clypeus distinctly concave, thick and rounded throughout. Anterior angles of the head [homologous with the anterior angles of the clypeus in Aulacocyclinae, according to BOUCHER (2006)] rounded, but much more prominent than the lateroclypeal margin. Frontal area, as a whole concave to flat, and smooth. Supra-orbital ridges elevated but not strongly, blunt, nearly straight; anterior part prominent, the apical angle rounded; posterior angle inclined and very obtuse. Eyes somewhat globulous, divided in the middle by the canthus, which is long and wide, the anterior angle very obtuse. Mediopostfrontal area convex and smooth. Postorbital area without pit, covered with setigerous punctuations. Antennae short; clubs trifilous, moderately long. Labrum with anterior margin and proximal sides strongly concave. Mandibles rather short; glabrous except the upper surface, a half basal with fine setigerous punctuations; incisor lobe with three developed teeth, the upper the smaller; dorsal teeth almost straight, the crest narrow and rounded; infra- and supra-internal teeth strong and fused. Mentum with the laterobasal part of the disk setigerous; lateral pits marked, with dense setigerous punctures; wings glabrous and smooth. Laciniae bidentate, the basal tooth small.

Thorax. Pronotum slightly elongated (fig. 1), smooth except the marginal groove with small punctuations and minute marks throughout; anterior groove enlarged and long; median groove marked, reaching the posterior side of the pronotum and the anterior groove; anterior angles very rounded, slightly prominent; lateral pits small, smooth, regular. Mesosternum smooth and glabrous. Metasternum (fig. 2) with lateral pits enlarged, clearly delimited; disk and lateroposterior areas smooth; latero-anterior and lateral areas with abundant and fine punctures with long setae. Elytra with marked punctuation, but fine and spaced, the lateral striae being the largest; humeral angles with a large tuft of short setae; anterior border with some setae; elsewhere glabrous. Protibiae (fig. 1) rather short and feebly enlarged. Pro- and mesofemora (fig. 3) with a few setigerous punctuations on the infra-apical area. Mesotibiae (fig. 3) with a strong post-median spine; apical forks strong, wide and acute. Metatibiae (fig. 4) as previously, but the postmedian spine much shorter.

Abdomen. Sternites III-VII without scars, flattened, very smooth and shining; VII with a marked apical groove, almost complete. Aedeagus (fig. 5) typical of Aulacocyclini: small (length: 1.6-1.8 mm), well sclerotized, elongated, rounded and smooth, phallobase and parameres fused forming a phallotheca; parameres (dorsal, lateral) narrow and rounded, or fused and rectangular (ventral); anterior margin of phallobase straight or slightly concave; phallus ovoid to globulous.

Polymorphism. – Except the total length, and the development of the central tubercle depending of the total length, the five specimens are very similar.

Systematic relationships. – Arrow (1950) suggested, although without precision, that *A. andrewesi* is closely allied to the Australian and New Guinean species of *Aulacocyclus*. This opinion is today debatable as less concrete element could favour a phylogenetic link with these species than with the ones of the Sunda Islands. Indeed, in this second group some species are

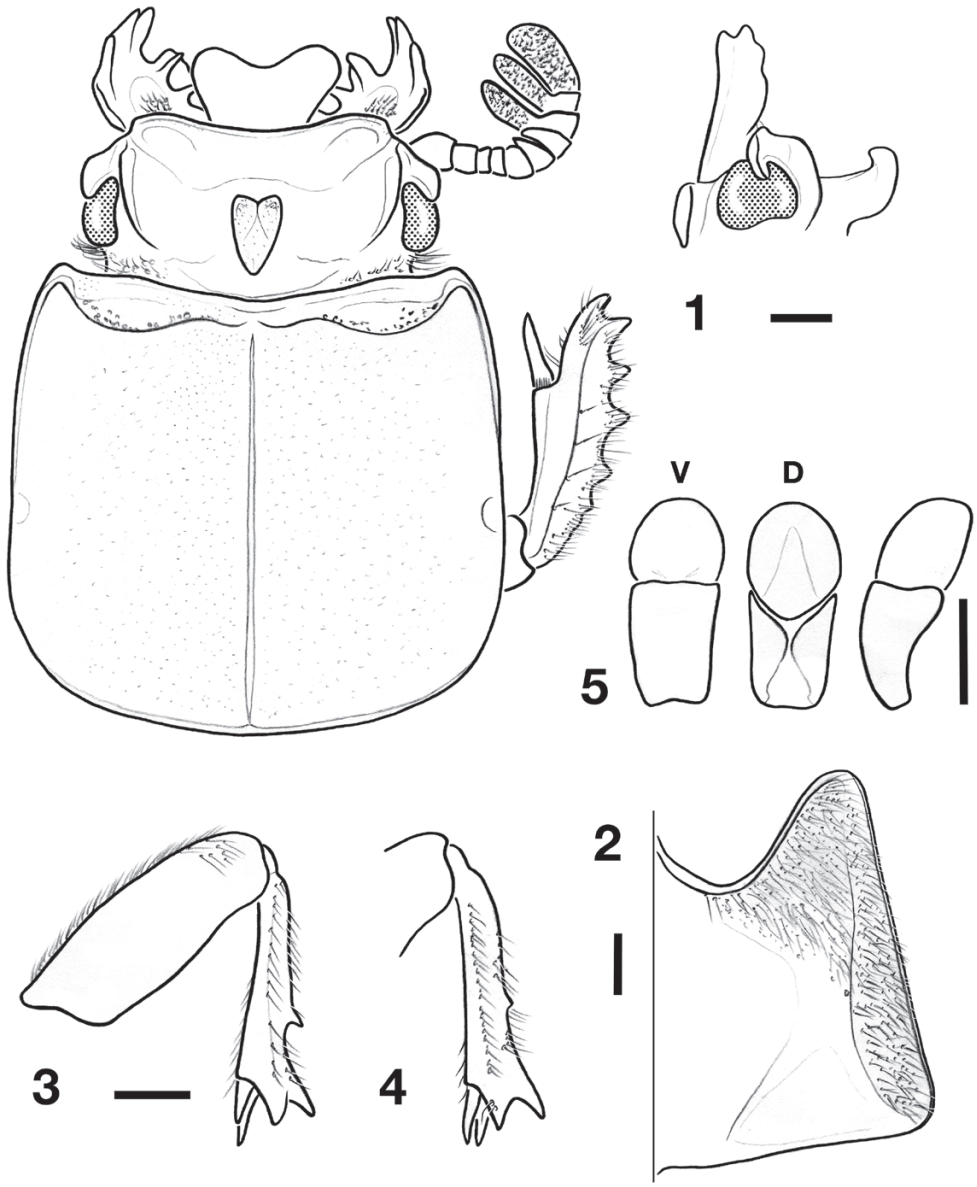

Fig. 1-5. – *Aulacocyclus andrewesi* Gravely (Nilghiri Hills, Indian Peninsula), morphological details. – **1**, Head, pronotum, tibia (dorsal), and anterior part of the head (left, lateral); pubescence of labrum, antenna and sides of mandibles not shown. – **2**, Metasternum (half right, ventral). – **3-4**, Femora and tibiae (left, ventral): **3**, median leg; **4**, posterior leg. – **5**, Aedeagus (ventral, dorsal, lateral). Scales: 1 mm.

very similar to *A. andrewesi*, at least the habitus and dimensions, such as *A. parryi* Kaup, 1871, *A. perlatus* Kaup, 1871, *A. felderi* Stoliczka, 1873, *A. aruensis* Kuwert, 1891, or *A. celebensis* Heller, 1899. Most Australian species are very different, and some of them are also clearly bigger. As for the fauna of New Caledonia, it is well separated, in particular by minute characters of the mandibles, as shown BOUCHER (2006). On the other hand, we find, in the New Caledonian species, the same extended metasternal setae, occupying all sides of the sclerite, than in *A. andrewesi*. The well pronounced concavity of the anterior border of the clypeus, in *A. andrewesi*, is also found especially in the peculiar group of the two New Caledonian species, *A. pugnax* Fauvel, 1903, and *A. boudinoti* Boucher & Reyes-Castillo, 1997. For his part, DIBB (1935), who did not know *A. andrewesi*, indicates that « *it seems most closely allied to the widely distributed species* perlatus*, Kaup; it is, however, difficult to point to any character, apart from the central tubercle, by which to differentiate the species* ». The idea of a close relationship with *A. perlatus* and related species seems possible. However, the opinion of Dibb, with respect to some key characters of the head and the metasternum, appears somewhat unclear, if not erroneous.

The *Aulacocyclus* species inhabiting the Great Sunda group and a part of Melanesia are in small number and have the most closely appearence with *A. andrewesi*. These species are distributed from Sumatra to the Solomon, and between these two points they live in the islands having rainforest. *A. andrewesi* belongs to a very distinct biogeographical context. Finally, this species appears to be a true *Aulacocyclus*. However, on one hand it is well separated from all other species of the genus; on the other hand it has characters found in various species groups, but the same groups having distinct biogeographical patterns. Further phylogenetic consensus will be a help against these discrepancies, for determining the natural relationships of *A. andrewesi*.

Distribution, endemism. – The previous poor knowledge of *A. andrewesi* may explain that I unplanned the distribution of the genus *Aulacocyclus* in the Indian Peninsula (BOUCHER, 2006: chap. I, fig. 216). Consequently, the overlooking of this species comes down to exclude erroneously the tribe Aulacocyclini from a sub-continent! Otherwise, a misinterpretation is due to DIBB (1935), who cited the species from "Northern India". It is undoubtly an endemic of the Western Ghats, the Nilghiri Hills to the North, the Anamalai Hills to the South.

The biotopes occupied by *A. andrewesi* belong to the "forests of median elevation", as such synthetized BLASCO (1971). These formations, under the influence of currents of monsoon, are wet, deciduous to evergreen, dense or more or less open, according to their exposure. In every case, they belong to the narrow, but the wettest, with short dry season, lands of the Peninsula (LEGRIS & VIART, 1959; LABROUE *et al*., 1965). The elevation where the diversity and luxuriance of these forests are the highest is between 500 and 1200 m. *A. andrewesi* is known from this range.

The confirmed *Aulacocyclus* species in southwestern Indian Peninsula is enforcing the GRAVELY's idea (1914) on the past and present distribution of Aulacocyclinae in this part of Asia. *A. andrewesi* is one of the most occidental and isolated species in the subfamily. The hypothesis of another *Aulacocyclus* in the same region is rather unlikely. An exception could be the far southern reliefs in Kerala and Tamil Nadu, which are discontinuous with the previous hills. The only other Aulacocyclinae known to the west offshore of the Great Sunda group is *Comacupes kaupi* Boucher, 2004, an endemic of the Andaman Archipelago. It is a classical species for the genus (see BOUCHER, 2004), and its presence there does not seem exceptional. These lands form a physical bar with the islands arc from Java and Sumatra. Thus, the endemism of *A. andrewesi* is really distinct and shows again to be relictual, intracontinental, and more isolated. Such homologous process also occurred in the Passalinae Macrolinini, as the genus *Pleurarius* Kaup, 1868, also restricted to the Western Ghats.

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References

Arrow G. J., 1950. – *The fauna of India including Pakistan, Ceylon, Burma and Malaya*. Vol. IV, *Coleoptera Lamellicornia Lucanidae and Passalidae*. London : Taylor & Francis, 275 p.

Blasco F., 1971. – Montagnes du sud de l'Inde. Forêts, savanes, écologie. *Institut Français de Pondichéry, Travaux de la Section Scientifique et Technique,* **10** (1) : 1-436.

Boucher S., 2004. – The species of Passalidae (Insecta: Coleoptera) described by Johann Jakob Kaup: Historical overview and critical catalogue, with the description of four new species. *Kaupia*, **13** : 99-121.

—— 2006. – Évolution et phylogénie des Coléoptères Passalidae (Scarabaeoidea). Les taxons du groupe famille ; la tribu néotropicale des Proculini et son complexe *Veturius*. *Annales de la Société entomologique de France,* (N. S.) **41** (3-4) [2005] : 237-604.

Dibb J. R., 1935. – Further notes on *Aulacocyclus* (Col., Passalidae). *Stylops,* **4** (10) : 227-233.

Gravely F. H., 1914. – An Account of the Oriental Passalidae (Coleoptera). *Memoirs of the Indian Museum,* **3** : 177-353.

—— 1918. – A Contribution towards the Revision of the Passalidae of the World. *Memoirs of the Indian Museum,* **7** : 1-144.

Labroue L., Legris P. & Viart M., 1965. – Bioclimats du sous-continent indien. *Institut français de Pondichéry, Travaux de la Section Scientifique et Technique,* **3** (3) : 1-32.

Legris P. & Viart M., 1959. – Study of xerothermic index in India, Burma, Pakistan and Ceylon. *Institut Français de Pondichéry, Travaux de la Section Scientifique et Technique,* **1** (4) : 181-196.

Romain Garrouste & Roger Roy. – **Note sur le comportement maternel de la Mante *Paralygdamia madecassa*, endémique de Madagascar (Dictyoptera, Tarachodidae)**

(Accepté le 26.I.2017)

Au cours d'un inventaire entomologique du nord du Tsingy de Namoroka (Province de Mahajunga), l'un de nous (RG) a observé et photographié une mante femelle de la famille des Tarachodidae et son oothèque. Son comportement maternel est brièvement décrit à l'aide des images effectuées. Le spécimen a été collecté et déposé dans la collection du Muséum national d'Histoire naturelle (MNHN). Nous insistons sur le rôle des images scientifiques de terrain (*in vivo* ou encore "*wild shot*") associées aux dépôts de spécimens en collection pour mieux connaître la biologie des espèces, au sens large.

Données de collecte et d'observation. – Femelle de *Paralygdamia madecassa* Saussure & Zehntner, 1895 (fig. 1-2). Longueur : 34 mm. Madagascar, province de Mahajunga, district de Soalala, Parc national Tsingy de Namoroka, proche du village de Namoroka, camp expédition MNHN Namoroka 2016, 16°24'3,25"S - 45°17'28,01"E, 1.XI.2016, spécimen MNHN-EP-EP3557.

L'insecte, une femelle brachyptère, a été trouvé de nuit sur une branche basse d'un grand manguier (*Mangifera indica* L.) dans une zone forestière proche d'une rivière provenant des zones karstiques du massif de Namoroka. Pendant l'observation et les prises de vues, elle se tient sur l'oothèque, avec l'abdomen et le thorax plus ou moins plaqué. Lorsqu'elle est dérangée, elle se plaque d'avantage, se déplace (vers l'avant ou l'arrière, latéralement) vers l'élément perturbant (le doigt), faisant bouclier avec son corps ; elle n'a pas attaqué ou tenté de mordre. Déplacée de l'autre côté du rameau, elle se replace très vite en position initiale sur l'oothèque en effectuant un mouvement rotatif rapide. Elle peut aussi pivoter de haut en bas. Au repos, la mante replie ses pattes et passe inaperçue par ses couleurs cryptiques identiques à celles de l'oothèque, déposée sur une partie morte et nécrosée du rameau ayant perdu sa couleur verte.

L'oothèque mesure 31 mm de long, de 3,0 à 3,4 mm de large et a une épaisseur variable de 2,2 à 3,1 mm ; deux rangées d'œufs en alternance de 19 + 18 (= 37) logettes inclinées et en quinconce.

Plus de biologie dans les collections d'histoire naturelle. – Ce comportement maternel est caractéristique pour cette famille de Mantes mais n'avait pas encore été confirmé pour cette espèce (Roy, 2016).