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# Studies on Ethiopian Apionidae (Coleoptera). 1. Comments on the genus *Apiomorphus* Wagner, 1911, with description of a new South African species

by

M. A. ALONSO ZARAZAGA

Carretera de Cádiz, 89, 1° A (Edif. S. Joaquín), Málaga-4, Spain)

The author presents a new terminology for the Apionid tegmen and discusses the generic characters of *Apiomorphus* Wagner, 1911, describing *Apiomorphus (Apiomorphus) oberprieleri* spec. nov., closely related to *A. cyaneus* Wagner, 1911, and easily distinguishable by its shorter and more robust beak, transverse head, sparse inconspicuous erect setae only on odd elytral intervals, different shapes of tegminal plate, of apical plate of penis and the lanceolate sclerite in the internal sac of penis.

The genus *Apiomorphus* was described by Wagner in 1911 to include the only and type species, *Apiomorphus cyaneus* Wagner, 1911, from specimens from Cape Province. Twenty years later, E. Voss erected the subgenus *Apiomorphilus* with two new species, *A. inermipes* Voss, 1931, from Transvaal, and *A. corvinus* Voss, 1931, from Abyssinia, whose only valid subgeneric feature, as Balfour-Browne (1944) stated, is the lack of femoral teeth. This author described *A. marshalli* Balfour-Browne in the subgenus *Apiomorphus*, raising the number of species to four.

Thanks to the kindness of Mr R. Oberprieler, Plant Protection Research Institute, Pretoria, RSA, I have been able to study a small number of South African Apionidae, among which there is one new species belonging to this genus.

The study of this new species and of *A. cyaneus* Wagner has led me to reconsideration of the generic features, in an attempt to adapt them to present-day knowledge, based on an almost complete morphological study. Male genitalia terminology follows Lindroth (1957) except for the tegmen, which follows a new terminology.

## Male tegmen: considerations and terminology

Kissinger (1968: 5) considered the Apionid tegmen to consist of three parts, a median ventral strut (*manubrium*), a forked process on the posterior end of the manubrium (the *basal piece*) and a dorsal plate (the *paramere*) produced generally into a pair of apical lobes.

This interpretation does not take into account the fact that the tegmen has two parameres in Cucujiformia. These structures seem to have fused together and to the basal piece in Curculionoidea and Chrysomeloidea, being a plesiomorphous

character state for both groups. Another alternative hypothesis would be to consider both parameres totally lost and the dorsal portion of the basal piece protruding backward to form a plate-like structure with a parameroid appearance. This interpretation is considered less likely, because of the lack of facts demonstrating the absence of parameres to be a primitive feature. The prevailing trend in both superfamilies is the division into two pieces again (which by no means can be assimilated to parameres, being secondary formations) and towards reduction and loss, as in many subfamilies of Curculionidae and Chrysomelidae. Likewise, macrochaetae present on sclerotized plates at the apex give place to dense microchaetae on membranous apical lobes.

Be that as it may, a new terminology for Apionid tegmen is needed, interpreting it in agreement with its most likely origin, as set out below, bearing in mind that apex is directed backwards and base forwards (Fig. 13).

Kissinger's paramere consists really of three parts. The apical one consisting of the *parameroid lobes*, that can be fused together (plesiomorphous) or more or less split (apomorphous), lacking *fenestrae* (Kissinger's unsclerotized and depressed clear areas, plesiomorphous) at base or very marked and surrounded by melanised areas (apomorphous), and bearing one sclerotized apical plate with macrochaetae (plesiomorphous) or developing one membranous lobe with dense microchaetae (apomorphous).

The middle part, *dorsal portion of ring*, belongs to the basal piece, and is limited apically by the base of fenestrae and basally by the *arched line*, always present, more or less marked, which represents the fore dorsal margin of the basal piece.

The basal part, or *plate-base*, is a secondary outgrow, which can be absent (some spp. of genus *Corimalia* Gozis, 1885, plesiomorphous) or present and shaped variously (apomorphous). Since it is a secondary formation, as *parameroid lobes* are, its structure has great systematic and phylogenetic value, as Kissinger (1968) has already shown.

Splitting of the parameroid lobes can affect both the dorsal portion of ring and the plate-base in its progression towards the base. So, Kissinger's paramere can be called the *tegminal plate* and the free portion of the basal piece, the *free ring*.

It is assumed that this new explanation of the tegminal structure in Apionidae substantiates reasonably the consideration of fused plate and free ring to be plesiomorphous against the apomorphous state of being jointed by loss of sclerotization at the junction.

## Generic characters

The characters that I consider to define the genus are: Antenna inserted 0,22 – 0,33 × length of beak from base. Scrobe foveiform, not prolonged lateroventrally. Gena and gular region transversely wrinkled. Dorsal surface of prothorax tuberculate. Procoxa nearly touching front margin of prosternum. Front leg larger than others, profemur and protibia conspicuously elongate. Rim of procoxae with small inner tooth-like projection. 10th elytral stria shortened, reduced to the subhumeral region. Striae 1 and 9 join at apex, others variable. Mesocoxae separated about 0,2 × their diameter. Metatibial apical comb with fine, uniformly thick spines, similar to those of ascending comb. Onychium extending conspicuously beyond lobes of tarsomere 3. Claws weakly dentate, basal tooth obtuse. Male with all tibiae shortly mucronate. Male pygidium rounded apically, with a weak furrow which runs parallel to the apical thickened margin, furrow not defined dorsally. Tegmen: parameroid lobes with apical sclerotized plate bearing macrochaetae, no fenestrae present, although with probably homologous

unsclerotized, depressed areas; arched line present; plate-base protruding forward as two lateral, weakly sclerotized plates, more or less separate medially; free ring long, rigid, thick, not articulated with plate. Penis short, depressed; dorsal plate broad, sclerotized basal apophyses shorter than penis. Internal sac of penis with large basal sclerite, variously shaped.

Two characters given by Kissinger (1968) – only referable to the type species – are excluded from this list: the long and slender beak and the dentate femora.

In the following description, measurements include both sexes, unless stated otherwise. Terminology about the beak follows Damoiseau's on Brentidae (1967): prorostrum is the portion between apex and antennal insertion, mesorostrum is the antennal insertion, and metarostrum is the portion between mesorostrum and eyes.

***Apiomorphus (Apiomorphus) oberprieleri*** spec. nov. Figs. 1–12.

Diagnosis. Closely related to *A. cyaneus* Wagner, but differs mainly in its slightly transverse, inconspicuously conical head and slightly protruding eyes; in the beak, more robust and shorter than 1,25 × length of pronotum in both sexes (slender and longer than 1,25 × length of pronotum in *A. cyaneus*); in the presence of scattered, inconspicuous erect setae in the odd and marginal intervals (*A. cyaneus* with dense, conspicuous setae in all the intervals); in the shorter apical plate of penis, the lanceolate sclerite of the internal sac (H-shaped in *A. cyaneus*) and the differently shaped tegmen.

Description. Length (r.e.) 3,44–4,45 mm. Width 1,29–1,87 mm.

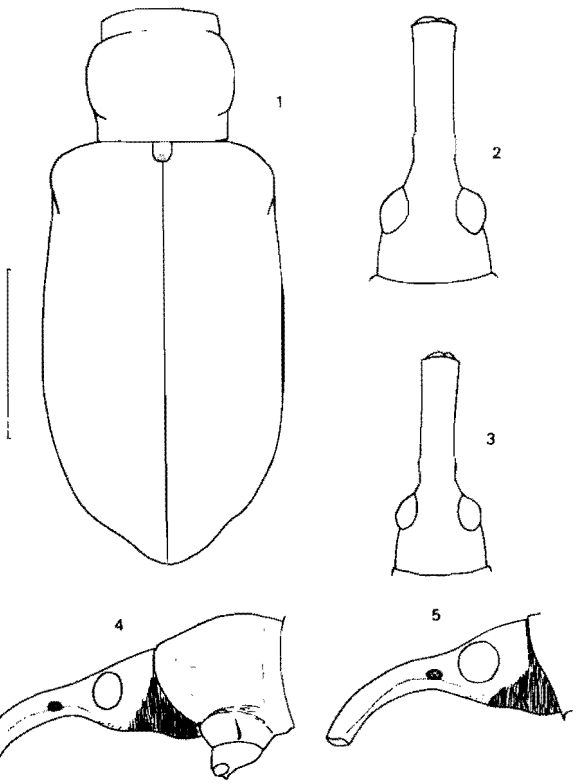
General coloration metallic bluish-black with violet glint in some areas, tarsi with same colour but glint duller; beak, antennae and scutellum black, metarostrum with green-brassy glint; underside with brassy, violet or bluish glint; vestiture dark, inconspicuous, very fine, of small hairs, arcuate in one row on the elytral intervals, some sparse erect hairs on the odd and marginal intervals, 5th urosternite with a cluster of erect setae at apex.

Male beak (Figs. 2, 4) 1,08 – 1,17 × as long as pronotum, 3,76 – 4,00 × as long as wide at apex; prorostrum in side view curved to extend almost one fourth of circumference of a circle, in dorsal view slightly widened from mesorostrum to apex, glabrous, shining, very finely and sparsely punctulate; metarostrum in side view straight, short, in dorsal view strongly widened from mesorostrum to eyes, more densely punctate, slightly pubescent. Mesorostrum 0,86 – 0,92 × as wide as apex of beak.

Female beak (Figs. 3, 5) similar to that of male, 1,14 – 1,20 × as long as pronotum, 3,52 – 4,16 × as long as wide at apex.

Antenna inserted 0,22 – 0,28 × length of beak from base, at a distance in front eye of 0,92 – 1,15 × as great as width of frons; scape straight, thickened in apical half, 4,0 – 4,4 as long as wide, 1,15 – 1,39 × as long as width of mesorostrum. Funicle clothed with hispid setae, with segments 1–5 narrow, at least 2 × as long as wide; segment 6 about 1,5 × as long as wide, obconical; segment 7 trapeziform, isodiametrical. Club 1,21 – 1,50 × as long as scape.

Eye round, convex, almost hemispherical, protruding slightly beyond outline of head in dorsal view, diameter about 1,15 × as long as width of frons. Frons 0,82 – 1,00 × as wide as apex of beak, with rough oblong punctures, interstices longitudinally confluent, with one slight narrow median furrow reaching to middle of metarostrum. Head transverse, 0,80 – 0,85 × as long as wide, vertex with transversely confluent rough punctures, diminishing laterally into wrinkles on ventral surface of head and temples.




Figs 1–5. *Apiomorphus (Apiomorphus) oberprieleri* spec. nov. 1. ♂ holotype, prothorax and elytra, dorsal view, schematic. 2. Id., head and beak, dorsal view. 3. ♀ paratype, head and beak, dorsal view. 4. ♂ holotype, head and beak, lateral view. 5. ♀ paratype, id. Scale = 1 mm.

Pronotum 0,88–1,00 × as long as wide, constricted apically and basally, more strongly so apically, without basal flange; apex 0,82–0,89 × as wide as base; pronotal tubercles irregularly hemispherical, less dense on disc, punctures between tubercles irregular, rugose; basal fovea obsolete, sulciform. Scutellum as long as wide, somewhat narrowed posteriorly, apically rounded, rear half longitudinally depressed.

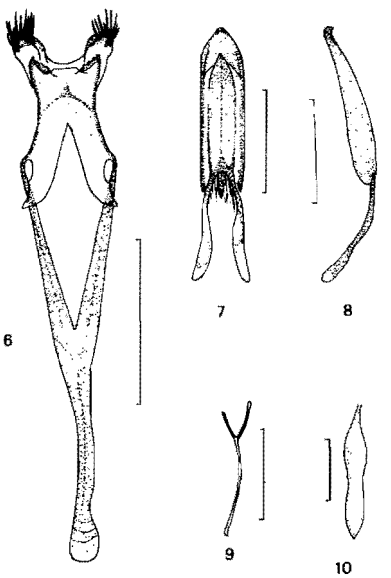
Elytra at humeri 1,61–1,78 × as wide as base of pronotum, 3,13–3,59 × as long as pronotum, 1,64–1,89 × as long as wide; humeral calluses developed. Intervals convex, 2 × as wide as striae, smooth and shining, with a few punctures in one row bearing almost inconspicuous, dull, arcuate hairs and setae almost equal in length, about 2 × as long as pronotal hairs. Striae strongly punctate, punctures quadrangular, separated by transverse bars as long as the punctures.

Profemur elongate, about 4,33 × as long as wide, in male with one longer spinelike tooth rising from fore ventral margin at a distance of 0,39 × length of profemur from apex, tooth about 0,29 × as long as widest point of femur (1 specimen shows 1–2 more small teeth on each side of larger one, another shows one trifid tooth on right

foreleg only) and 1–2 shorter teeth on back ventral margin at the same distance; female with only the fore tooth, but much shorter, only 0,15 × as long as widest point of femur (1 female shows two indistinct tubercles on back ventral margin). Meso- and metafemora with 1–2 spinelike teeth, in female shorter than in male. Tibiae with outer edge straight, inner edge bisinuate, setose, not serrate-dentate; longitudinally grooved in both sides of outer edge, so that edge is keeled; apex sharply produced inwards. Protibia long, narrow, about 9 × as long as wide at apex, 1,09–1,13 × as long as profemur, shortly mucronate in male, mucro black, about 0,38 × as long as width of protibial apex. Tarsi slender, 3rd tarsomere deeply bilobed; 1st protarsomere about 2,77 × as long as wide in male, about 2,45 × as long as wide in female, slightly incurved; 2nd protarsomere about 1,25 × as long as wide in male, isodiametrical in female, triangular. Claws obtusely and weakly dentate at base.

Sternites 1 and 2 transversely wrinkled, fore margin of 1st sternite and metasternum with a strong rim. Intermetacoxal apophysis depressed. Sternites 3, 4 and 5 microreticulate, 5th with a cluster of erect setae at apex, transverse and apically truncate in male, less transverse and apically rounded in female. Suture I conspicuous, more impressed laterally.

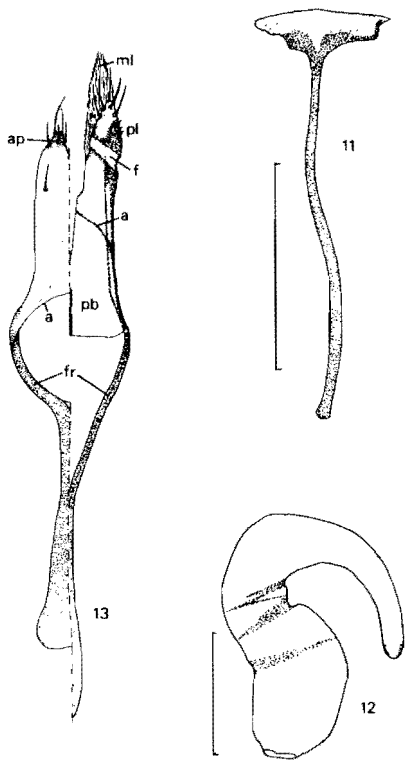
Aedeagus: Tegmen (Fig. 6) with parameroid lobes as long as wide, widely separated, sclerotized apically, with two scabrose lines bearing insertions of 9–10 marochaetae; dorsal portion of ring sclerotized, apically denticulate; space between dorsal portion of ring and apical plates weakly sclerotized, in lateral view strongly depressed; arched line present; plate-base with two widely split lateral plates, protruding forward and pointing outward. Penis (Figs. 7, 8) depressed, in lateral view converging towards




Figs 6–10. *Apiomorphus (Apiomorphus) oberprieleri* spec. nov., ♂ holotype. 6. Tegmen, dorsal view. 7. Penis, dorsal view. 8. Id., lateral view. 9. Spiculum gastrale. 10. Sclerite of internal sac of penis. Scales: 6 – 9 = 0,5 mm.; 10 = 0,1 mm.

apex, apex slightly produced dorsally; internal sac with one lanceolate, medially constricted, apically stalked sclerite about 6 × as long as wide, as in Fig. 10.

Female genitalia: Spiculum ventrale and spermatheca as in Figs 11, 12.




Figs 11–13. *Apiomorphus (Apiomorphus) oberprieleri* spec. nov., ♀ paratype. 11. Spiculum ventrale. 12. Spermatheca. Scale: 11 = 0,5 mm.; 12 = 0,1 mm. 13. Composite tegmen to illustrate new terminology. Left side (showing plesiomorphous state) corresponds to *Corimalia minutissima* (Tournier, 1867) and right (apomorphous) to *Apion (Eutrichapion) vorax* Herbst, 1797, not at the same scale: a, arched line; ap, apical plate; f, fenestrae; fr. free ring; ml, membranous lobe; pb, plate-base; pl, parameroid lobes.

MATERIAL EXAMINED. ♂ holotype: SOUTH AFRICA: Dullstroom Nature Reserve (Transvaal), iv.1980, R. C. Dieckmann; National Collection of Insects, Pretoria, South Africa (genitalia mounted in Canada balsam; specimen lacking left metatarsus and two right metatarsomeres). 2 ♂, 3 ♀ paratypes, same data and depository except 1 ♂, 1 ♀ paratype in my collection.

ETYMOLOGY. I am very pleased to name this species after Mr R. Oberprieler, Pretoria, RSA, who kindly sent the specimens for identification.

REMARKS. This species seems to show more plesiomorphous characters than *A. cyaneus* does, namely: shorter and more robust beak; transverse head; irregular pronotal tuberculation; more numerous macrochaetae on apex of parameroid lobes; shorter, transversely triangular apical plate of penis; less deeply separated parameroid lobes; sclerite of internal sac of a less elaborate type. For comparison between male genitalias, see Kissinger (1968, Figs 7k, 10 n–p).

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