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New species and new records of the genera *Fortagonum* Darlington and *Collagonum*, gen. nov. from New Guinea

(Insecta, Coleoptera, Carabidae, Agoninae)*

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The genus *Fortagonum* Darlington from New Guinea is newly delimited. The following 7 new species are being described: *Fortagonum acuticolle*, spec. nov., *F. bisetosiceps*, spec. nov., *F. denticulatum*, spec. nov., *F. depressum*, spec. nov., *F. latum*, spec. nov., *F. spinosum*, spec. nov., and *F. unipunctatum*, spec. nov. A complete new key to all known species of this genus is given. Following species are transferred from *Fortagonum* to a new genus *Collagonum*, gen. nov.: *Fortagonum limum* Darlington, *F. hornabrooki* Darlington, *F. distortum* Darlington, *F. laticolle* Baehr, and *F. ophthalmicum* Baehr. Additional 4 species and 1 subspecies of this genus are newly described: *Collagonum convexum*, spec. nov., *C. riedeli*, spec. nov., *C. robustum*, spec. nov., *C. violaceum*, spec. nov., and *C. laticolle macrops*, subspec. nov. New records of *C. laticolle laticolle* (Baehr) are dealt with and the male genitalia of this species are for the first time described.

Both genera of odd-shaped, mountain-living agonine beetles are widely distributed throughout New Guinea, but most species have apparently very restricted ranges. Even in its restricted sense *Fortagonum* is a genus of convenience that may be further divided in certain species-groups of very uniform structure. However, further splitting in new genera is at present not advisable in view of the weak generic concepts within the New Guinean Agoninae, especially those related to *Fortagonum* in its new sense. The high degree of similarity in body shape as well as in structure of the male genitalia within both genera and in the different species-groups of *Fortagonum* is evidence of a rather recent evolution of the numerous species. In most species, however, chetotaxy is highly characteristic. There are several morphological trends, mostly reductions, within both genera, the evolutionary significance of which is largely unknown due to the extremely poor knowledge about habits and life history of the species.

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Introduction

The genus *Fortagonum* Darlington comprises at present 16 species from both political divisions of New Guinea. The genus was originally erected for five rather differently shaped species (Darlington 1952) that are characterized at the same time by a reduced number of fixed setae on head, pronotum, and elytra and by reduced wings. Later Darlington (1971) described additional species some of them possess an even more irregular body shape. Recently I described three additional new species, two of them winged, discussed the definition of the genus on the basis of these new species, and included two

* Results of the entomological explorations of A. Riedel in New Guinea in 1992, 1993, and 1994.

Unfortunately, Darlington's (1952, 1971) treatments suffer from the failure to investigate the male genitalia that are rather differently shaped and are in some species highly modified. Moreover most species are so far known from single or few specimens only, therefore the male genitalia of only five species have been described and at present they are not very useful for the identification of the species.

With respect to body shape the genus *Fortagonum* in its old sense can be divided into two fairly clear-cut groups: The first group includes species of rather oodine shape with more or less fusiform, anteriorly markedly narrowed pronotum, but also some rather narrow species with laterally convex, anteriorly and posteriorly about equally narrowed pronotum. This group contains winged and wingless species and has generally a reduced number of supraorbital, pronotal, and elytral setiferous punctures. However, body shape, form of the mandibles, shape of aedeagus, as well as the wing-and-seta formula (Darlington 1952, 1971, Baehr 1992) are rather varied in this group, so it could perhaps be further divided into subgroups of closer relationships. The second group includes species with distorted, very wide, and laterally evenly rounded pronotum with wide, explanate lateral margins, but with rather elongate, parallel elytra, with full or reduced set of fixed setae, and with or without wings. The species of this rather homogeneous group are very similar in external structure and all species of which males are known possess a highly characteristic and specialized aedeagus. On the basis of these striking external and genitalic features the species of this latter group are herewith excluded from *Fortagonum* and a new genus *Collagonum*, gen. nov. is erected for them. Although the species of this genus are externally highly similar and the male genitalia (as far as they are known) are also very similar, chetotaxy of head, pronotum, and elytra, however, expressed in the wing-and-seta formula, is generally different between species and allows the identification.

Some species of the genus *Fortagonum* in its restricted sense are also rather similar and are mainly distinguished by their chetotaxy. Unfortunately male genitalia are described from very few species only, hence their significance for species distinction is still uncertain, but may be very useful according to the striking differences seen in the few examined species. In view of the division of the genus in the mentioned species-groups the question arises, whether it should be divided in even more genera. Such further subdivision might prove to be the appropriate way in the future, but at the present state of knowledge of the Agonine fauna of New Guinea as a whole, and especially of the generic limits within the genera related to *Fortagonum*, I think it useful not to create new genera apart from the very peculiar *Collagonum*, but for the present to accept Darlington's genera, even when some of these seem to be rather genera of convenience than well established taxonomic units.

Measurements

Measurements were made under a stereo microscope using an ocular micrometer. Length has been measured from tip of labrum to apex of elytra, hence, measurements may slightly differ from those of Darlington. Length of pronotum for width/length ratio has been measured from middle of apex to base.

Characters

The main differentiating characters are in the chetotaxy that is expressed in a wing-and-seta formula first used by Darlington (1952, 1971) and followed by Baehr (1992), further in body shape, and in shape and structure of the aedeagus when this is known. Shape of aedeagus, as well as presence and number of sclerotized teeth inside the internal sac, seem to yield very useful differentiating characters. Because in almost all of Darlington's species the male genitalia have not been examined or males are still unknown, comparison is at present possible only for most species described herein or in my previous paper (Baehr 1992), and it is generally possible in more species of *Collagonum* than of *Fortagonum* proper.

Deposition of types

The holotypes of the new species are presented to the Zoologische Staatssammlung München (ZSM), but some are deposited as permanent loan in the collection of the author (ZSM-CBM).

Genus *Fortagonum* Darlington

Darlington, 1952, p. 247, figs 14, 64-66.

Darlington 1971, p. 316, figs 70-76.

Baehr 1992, p. 74, figs 1-6.

This genus is characterized by the rather heavy build of most species and by the following wing-and-seta formula in which presence/absence of wings (+w/-w), of supraorbital setae, pronotal setae, and discal elytral setae (+/-) are expressed in the above order. () means that the usual state is sometimes varied, +- means that within the genus both states are present to about the same ratio:

+w-w (-)(+) -+- +-+-

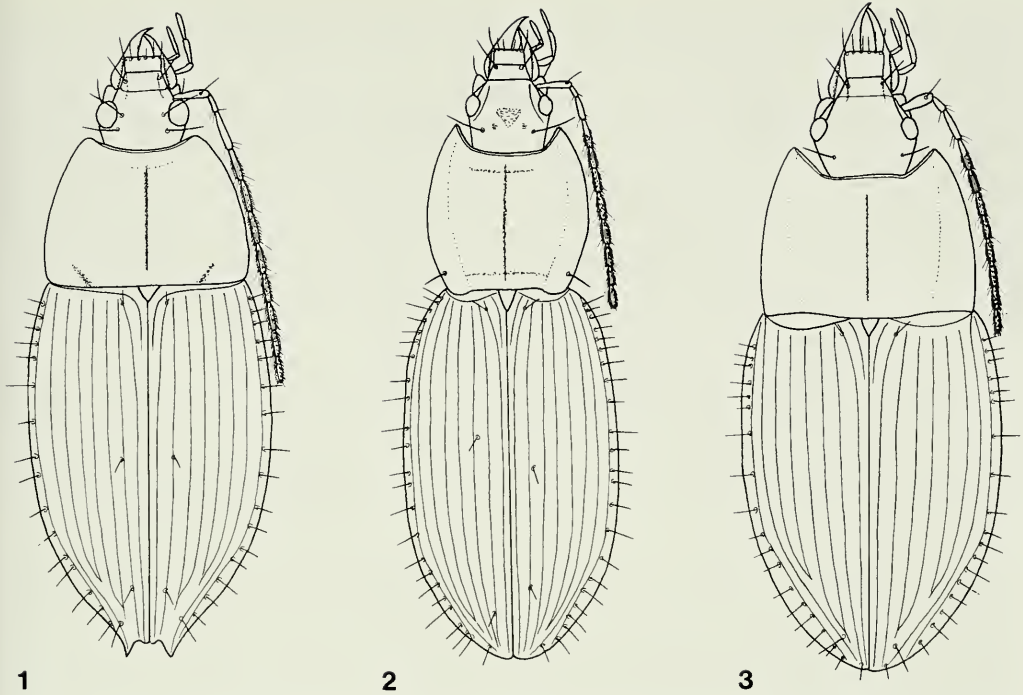
This formula clearly indicates a considerable variation of states within this genus that is, in this respect, not well founded. Moreover, the most closely related genus *Altagonum* Darlington has basically the same wing-and-seta formula, when all exceptions that occur within both genera are considered: +w (+)+ -(+) +- (+) (+). Hence, contrary to Darlington's opinion, both genera are not unequivocally differentiated by the wing-and-seta formula alone, but rather by body shape in combination with some genitalic characters.

Updated key to the species of the genus *Fortagonum* Darlington
(partly adapted from Darlington 1971)

Since the generic limits of *Fortagonum* Darlington are newly defined, a complete new key is presented that replaces the previous key in Baehr (1992).

1. Wings present 2.
- Wings absent 6.
2. Both pairs of supraocular setae absent; elytra bisetose, apex spined, striae slightly crenulate, intervals depressed. Vogelkop, extreme western Irian Jaya *depressum*, spec. nov.
- At least posterior supraocular seta present 3.
3. Both supraorbital setae present. Eastern Irian Jaya *bisetosiceps*, spec. nov.
- Anterior supraorbital seta absent 4.
4. Elytra unisetose (only median seta present); prothorax narrower, little wider than long. Central eastern Irian Jaya *denticulatum*, spec. nov.
- Elytra bisetose (median and posterior setae present); prothorax wider, distinctly wider than long. Distribution different 5.
5. Pronotum wider, sides more straight, anterior angles more protruding. Extreme western Irian Jaya *subconicollae* (Darlington)
- Pronotum narrower, sides more convex, anterior angles less protruding. Central Papua New Guinea *bigemum* (Darlington)
6. Both supraocular setae absent; anterior angle of pronotum laterally slightly produced. Short, wide, convex species. Central Irian Jaya *bufo* Darlington
- Posterior supraocular seta present; anterior angle of pronotum different. Various shaped species 7.

7. Elytra usually trisetose, rarely unilaterally unisetose or bisetose; mandibles never straight and very elongate. Species from central Papua New Guinea 8.
 - Elytra asetose, or unisetose, or bisetose; either mandibles straight and very elongate, or more or less fusiform species. Species from central and eastern Irian Jaya 11.
8. Posterior pronotal seta present 9.
 - Posterior pronotal seta absent 10.
9. Margin of pronotum wide; wide, fusiform species *oodinum* Darlington
 - Margin of pronotum narrow; rather narrow, barely fusiform species *antecessor* Darlington
10. Pronotum wider, but less conical; elytra weakly iridescent *fortellum* Darlington
 - Pronotum narrower, but rather conical; elytra markedly iridescent *okapa* Darlington
11. Posterior pronotal seta present; elytra unisetose or bisetose 12.
 - Posterior pronotal seta absent; elytra asetose 14.
12. Pronotum laterally regularly convex, base as wide as apex, basal angles rounded off, apex very protruding (Fig. 2); elytra bisetose, anterior seta absent. Eastern central Irian Jaya
 - Pronotum laterally feebly convex, base much wider than apex, basal angles rectangular and obtuse, apex less protruding (Figs 9, 10); elytra unisetose, only median seta present. Eastern Irian Jaya 13.
23. Apex of elytra not spinose, though sutural angle faintly denticulate, elytra slightly wider; pronotum barely narrowed towards base (Fig. 9). Area east of mountain range to the west of valley of Borme River *unipunctatum*, spec. nov.
 - Apex of elytra elongately spinose opposite 3rd interval, sutural angle not denticulate, elytra slightly narrower; pronotum distinctly narrowed towards base (Fig. 10). Area west of mountain range to the west of valley of Borme River *spinotum*, spec. nov.
14. Mandibles not unusually elongate; apex of elytra distinctly spinose opposite 3rd interval; short and wide, markedly fusiform species. Central Irian Jaya *curtum* Baehr
 - Mandibles straight and markedly elongate; apex of elytra not spinose; either rather elongate, not markedly fusiform species, or short and wide species with almost parallel lateral borders of pronotum 15.
15. Basal margin of elytra not interrupted at 3rd interval; prothorax $<1.8 \times$ as wide as head 16.
 - Basal margin of elytra interrupted at 3rd interval; prothorax $>2 \times$ as wide as head 17.
16. Rather wide, almost parallel species; pronotum $>1.25 \times$ as wide as long. Central Irian Jaya
 - Narrow, fusiform species with evenly rounded lateral margins of pronotum; pronotum c. $1.1 \times$ as wide as long. Central Irian Jaya *formiceps* Darlington
17. Pronotum wider at base, ratio width of base/width of apex c. 1.8, sides more curved; elytra rather elongate. Central Irian Jaya *cychriceps* Darlington
 - Pronotum narrower at base, ratio width of base/width of apex c. 1.65, sides more parallel; elytra rather short. Central eastern Irian Jaya *latum*, spec. nov.



Figs 1-3. Habitus. 1. *Fortagonum bisetosiceps*, spec. nov. ♀ holotype. 2. *F. acuticolle*, spec. nov. ♂ holotype. 3. *F. latum*, spec. nov. ♀ holotype. Lengths: 10.3 mm, 13.2 mm, 11.2 mm.

The species

Fortagonum bisetosiceps, spec. nov.

Figs 1, 4, 30

Types. Holotype: ♀, Irian Jaya, Jayawijaya-Pr., Bommela 1750 m, 30.8.-1.9.1992, leg. A. Riedel (ZSM-CBM).

Diagnosis. Distinguished by the conical, dorsally evenly convex pronotum without any trace of a marginal channel, by presence of wings, presence of both supraorbital setae, absence of both pronotal setae, absence of the anterior discal seta, and by the distinctly spined elytra.

Description

Measurements. Length: 10.3 mm; width: 4.35 mm. Ratios. Width/length of pronotum: 1.47; width base/apex of pronotum: 1.78; width pronotum/head: 2.12; width elytra/pronotum: 1.23; length/width of elytra: 1.56.

Wing-and-seta formula: +w ++ — -++.

Colour. Black, elytra with faint violaceous lustre. Lateral margins of pronotum reddish translucent, labrum, mouth parts, antenna, and tibiae and tarsi dark reddish-piceous, 3rd antennomere dark in middle. Lower surface black.

Head. Narrow compared with prothorax. Neck rather wide, somewhat imbedded in prothorax. Eyes fairly large, laterally not much projecting, orbits distinct, evenly curved. Clypeal suture distinct. Labrum rectangular, apex feebly concave. Mandibles elongate, straight, but not porrect. Antenna very elongate, delicate, surpassing base of pronotum by about three segments, median antennomeres c. 5 × as long as wide. Both palpi elongate, basal maxillary palpomere thickened. No furrow medially of eyes, though a shallow furrow above antennal base present. Both supraocular setae present, posterior seta

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in front of posterior margin of eye. Clypeus and anterior part of frons with short, shallow, parallel furrows, frons evenly convex, absolutely smooth. Microreticulation isodiametric, superficial. Surface glossy.

Prothorax. Wide, dorsally evenly convex, markedly conical, widest in posterior third, laterally evenly convex, strongly narrowed to apex, slightly narrowed to base. Anterior angles feebly projecting, widely rounded off. Apex moderately excised. Lateral margin convex throughout, not bordered, without any trace of a marginal channel. Basal angles rounded off. Base almost straight. Disk with shallow, v-shaped sulcus in apical third, base near basal margin with a shallow, circular impression on either side. Median line incomplete, in middle rather distinct, ending far from apex and base. Apex markedly bordered, base not bordered. Both marginal setae absent. Disk impunctate, with some fine transverse wrinkles. Microreticulation superficial, near apex and base isodiametric and more conspicuous than on disk, laterally consisting of very fine longitudinal meshes, on disk almost wanting. Surface on disk glossy.

Elytra. Moderately elongate, dorsal surface rather convex, lateral borders faintly rounded, in middle almost parallel. Preapical sinuosity almost absent. Widest diameter slightly in front of middle. Shoulders wide, angulate but not dentate, apex with distinct triangular spine opposite 3rd interval. Striae deep, impunctate, intervals slightly convex. Anterior discal seta absent, median and posterior setae situated at 2nd stria. 16 marginal setae and 1 preapical seta at 7th stria present. Intervals impunctate. Microreticulation almost wanting. Surface glossy, rather iridescent. Wings present.

Lower surface. Prosternal process short, rounded behind coxae, posteriorly depressed, laterally bordered. Proepisternum smooth. Mesepisternum very sparsely punctate. Metepisternum elongate, c. 2 × as long as wide at anterior border. Epipleurae anteriorly moderately wide, smooth. Abdomen impunctate, though laterally with numerous fine wrinkles and shallow impressions. Microreticulation dense, isodiametric. ♀ sternum VII quadrisetose, apex regularly curved.

Legs. Thin and elongate. 4th tarsomere medially faintly excised. 5th tarsomere asetose beneath. Vestiture of ♂ anterior tarsus unknown.

♂ genitalia. Unknown.

♀ genitalia. Stylomere 2 elongate, little curved, with obtuse apex, with 3 ventral ensiform setae, a dorsal ensiform seta and one nematiform seta in a deep furrow moderately close to apex. Apex of stylomere 1 ventrally with 6-7 setae near base of stylomere 2. Lateral plate with c. 10 setae at or near margin.

Variation. Unknown.

Distribution (Fig. 30). Eastern central Irian Jaya. Known only from type locality.

Habits. Collected in rain forest in median altitude.

Relationships. This species is certainly closely related to those species that were originally included in the genus *Altagonum*, namely *F. bigemum* (Darlington) and *F. subconicolle* (Darlington). The crucial point would be the aedeagus that is hitherto unknown in all three species.

Etymology. The name refers to the presence of both supraorbital setae.

Fortagonum acuticolle, spec. nov.

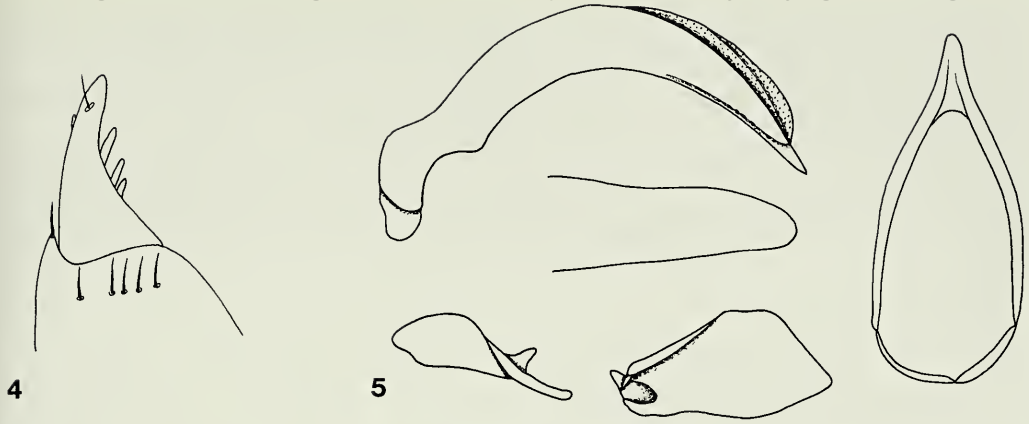
Figs 2, 5, 30

Types. Holotype: ♂, Irian Jaya, Jayawijaya-Pr. Diuremna, 1900-2100 m, 9.-11.IX.1992, leg. A. Riedel (ZSM-CBM).

Diagnosis. Distinguished by absence of wings, rather narrow, elliptic pronotum with deep marginal channel and rounded basal angles that is at base as wide as at apex, fairly elongate elytra with depressed disk behind shoulders, rounded apex, and convex intervals, and by absence of the anterior supraocular seta and the anterior pronotal seta.

Description

Measurements. Length: 13.2 mm; width: 5.2 mm. Ratios. Width/length of pronotum: 1.18; width base/apex of pronotum: c. 1.10; width pronotum/head: 1.75; width elytra/pronotum: 1.30; length/width of elytra: 1.63.



Figs 4, 5. Genitalia. 4. *Fortagonum bisetosiceps*, spec. nov. ♀ stylomeres. 5. *F. acuticolle*, spec. nov. ♂ aedeagus, apex of aedeagus, parameres, and genital ring.

Wing-and-seta formula: -w -- -- + + + +.

Colour. Black. Mouth parts, antenna, and tarsi dark piceous, tibiae piceous, 1st-3rd antennomeres black. Lower surface black.

Head. Rather wide compared with prothorax. Neck rather wide, barely imbedded in prothorax. Eyes rather small, laterally little projecting, orbits indistinct, slightly oblique. Clypeal suture distinct. Labrum rectangular, apex feebly concave. Mandibles elongate, straight, but not correct. Antenna elongate, surpassing base of pronotum by about two segments, median antennomeres c. 3 × as long as wide. Both palpi elongate, basal maxillary palpomere thickened. No furrow medially of eyes, though a shallow furrow above antennal base present. Only the posterior supraocular seta present, far removed from posterior margin of eye. Clypeus and anterior part of frons with short, shallow, somewhat irregular furrows, surface of clypeus irregular. Frons in middle with a somewhat trifold impression, laterally with another shallow depression that bears some sharp, oblique-transverse striae. Inside of eyes with few short, sharp lines. Whole surface of head rather irregular. Microreticulation posteriorly highly superficial, almost wanting, anteriorly more distinct, about isodiametric, surface around the depressions with sparse and fine puncturation, moderately glossy.

Prothorax. Rather narrow and elongate, about elliptic, laterally evenly convex, base as wide as apex, widest diameter in middle. Disk convex, lateral margins somewhat explanate, upturned, lateral channel deep. Anterior angles markedly projecting, obtuse at apex. Apex deeply excised, in middle straight. Basal angles widely rounded off, somewhat projecting over middle of base. Base in middle straight. Disk convex with very shallow, rather transverse sulcus in apical fourth, base near basal margin with a deep, circular impression on either side and with a very shallow transverse impression. Median line incomplete, fine, ending far from apex and base, situated in a weak impression. Apex distinctly bordered, lateral margin bordered in anterior half, base not bordered. Anterior marginal seta absent, posterior seta apparently situated near lateral margin far removed from basal angle (though setae absent, only vague traces of the pore present!). Disk impunctate, microreticulation barely visible. Surface glossy.

Elytra. Moderately narrow and elongate, dorsal surface moderately convex, distinctly impressed behind shoulders. Lateral borders in middle almost straight. Apex regularly rounded. Widest diameter about in middle. Shoulders wide, angulate but not dentate, though basal border deeply concave. Apex without any spine or denticle. Striae deep, intervals convex. All discal setae present, anterior seta situated at 3rd stria, median and posterior setae at 2nd stria. 19-20 marginal setae present. Intervals impunctate. Microreticulation highly superficial, consisting of extremely fine, transverse lines. Surface moderately glossy, not iridescent. Wings absent.

Lower surface. Prosternal process short, evenly rounded behind coxae, posteriorly moderately depressed, triangular, ventrolaterally bordered. All episterna irregularly and superficially punctate, with very fine microreticulation, rather dull. Metepisternum fairly shortened, c. 1.3 × as long as wide

at anterior border. Epipleura anteriorly moderately wide, rugose. Abdomen impunctate, though laterally with several fine, elongate wrinkles and shallow impressions. Microreticulation fine, dense, isodiametric. ♂ sternum bisetose, apex regularly curved.

Legs. Rather thin and elongate. 4th tarsomere medially faintly excised. 5th tarsomere asetose beneath. 1st-3rd tarsomeres of ♂ anterior tarsus biserially squamose.

♂ genitalia. Genital ring rather narrow and parallel, symmetric, with very elongate apex. Aedeagus narrow, very strongly curved, lower surface markedly concave. Apex short, widely rounded off. Internal sac in holotype almost invisible, apparently no sclerotized pieces present. Both parameres elongate, left paramere with angulate apex, right paramere with attenuate, on lower surface excised apex.

♀ genitalia. Unknown.

Variation. Unknown.

Distribution (Fig. 30). Eastern central Irian Jaya. Known only from type locality.

Habits. Collected in rain forest in median altitude.

Relationships. Rather isolated species, perhaps next related with species like *F. formiceps* Darlington, but without possessing porrect mandibles.

Etymology. The name refers to the acute anterior angles of the pronotum.

Fortagonum latum, spec. nov.

Figs 3, 6, 30

Types. Holotype: ♀, Irian Jaya, Jayawijaya-Pr. Langda, 2100-2300 m, 27.-28.8.1992, leg. A. Riedel (ZSM-CBM).

Diagnosis. Distinguished by absence of wings, short and wide body shape, wide, posteriorly parallel pronotum with wide marginal channel, elongate, straight, porrect mandibles, and absence of anterior supraocular seta, both pronotal setae, and all discal setae.

Description

Measurements. Length: 11.2 mm; width: 4.95 mm. Ratios. Width/length of pronotum: 1.38; width base/apex of pronotum: 1.62; width pronotum/head: 2.09; width elytra/pronotum: 1.16; length/width of elytra: 1.37.

Wing-and-seta formula: -w -+ — ---.

Colour. Black. Lateral margins of pronotum reddish translucent, labrum, mouth parts, antenna, and tibiae and tarsi dark reddish-piceous, femora dark piceous. Lower surface black.

Head. Narrow compared with prothorax. Neck rather wide, somewhat imbedded in prothorax. Eyes small, laterally barely projecting, orbits elongate, distinctly longer than eyes, evenly curved. Clypeal suture moderately distinct. Labrum rectangular, apex feebly biconcave. Mandibles very elongate, straight, porrect. Antenna moderately elongate, surpassing base of pronotum by about two segments, median antennomeres $<3 \times$ as long as wide. Both palpi very elongate, basal maxillary palpomere thickened. No furrow medially of eyes, though a shallow furrow above antennal base present. Only posterior supraocular seta present, far removed from posterior margin of eye. Clypeus and anterior part of frons with several short, shallow, parallel furrows, frons anteriorly with two circular impressions, in middle evenly convex, absolutely smooth. Microreticulation isodiametric, very fine, rather superficial. Surface glossy.

Prothorax. Wide, square, at apex very wide, posterior half parallel, slightly narrowed to apex. Disk evenly convex, lateral margins widely explanate. Anterior angles markedly projecting, obtuse at apex. Apex deeply excised, in middle convex. Lateral margin anteriorly weakly convex, with wide, shallow marginal sulcus. Basal angles rectangular, at apex obtusely rounded. Base laterally straight, in middle very faintly produced. Disk convex with extremely shallow, v-shaped sulcus in apical fourth, base near basal margin with a deep, circular impression on either side and with a very shallow transverse impression. Median line incomplete, fine, ending far from apex and base. Apex and lateral margins distinctly bordered, base not bordered. Both marginal setae absent. Disk impunctate. Microreticulation very fine, on disk highly superficial, near apex and base isodiametric and more conspicuous, on disk consisting of fine transverse lines. Surface glossy.



Figs 6-8. ♀ stylomeres. 6. *Fortagonum latum*, spec. nov. 7. *F. unipunctatum*, spec. nov. 8. *F. spinosum*, spec. nov.

Elytra. Short and wide, dorsal surface rather convex though depressed on disk, lateral borders in anterior half almost straight. Preapical sinuosity absent, lateral margin in posterior half evenly convex. Widest diameter about in middle. Shoulders wide, angulate but not dentate, apex rounded off. Striae deep, impunctate, intervals faintly convex. Discal setae absent. 18 marginal setae and 1 preapical seta at 7th stria present. Intervals impunctate. Microreticulation almost wanting. Surface highly glossy, rather iridescent. Wings absent.

Lower surface. Prosternal process very short, straight, posteriorly depressed, ventrolaterally bordered. Proepisternum smooth. Mesepisternum impunctate. Metepisternum short, shorter than wide at anterior border. Whole epipleura wide, almost smooth. Abdomen impunctate, though laterally with some fine, elongate wrinkles and shallow impressions. Microreticulation dense, isodiametric, very superficial. ♀ sternum VII quadrisetose, apex regularly curved.

Legs. Thin and elongate. 4th tarsomere medially faintly excised. 5th tarsomere asetose beneath. Vestiture of ♂ anterior tarsus unknown.

♂ genitalia. Unknown.

♀ genitalia. Stylomere 2 elongate, almost straight, with obtuse apex, with 2 ventral ensiform setae, a dorsal ensiform seta and one nematiform seta in a deep furrow moderately close to apex. Apex of stylomere 1 ventrally with 6 setae near base of stylomere 2. Lateral plate with 5-6 setae at or near margin.

Variation. Unknown.

Distribution (Fig. 30). Eastern central Irian Jaya. Known only from type locality.

Habits. Collected in rain forest in median altitude.

Relationships. This species is certainly very closely related to the rather similarly shaped *F. cycchriiceps* Darlington that has the same wide, quadrate pronotum and similarly porrect mandibles.

Etymology. The name refers to the wide body shape.

Fortagonum unipunctatum, spec. nov.

Figs 7, 9, 30

Types. Holotype: ♀, Irian Jaya, Jayawijaya-Pr. Borne, 1500-2000 m, 4.8.1992, leg. A. Riedel (ZSM). - Paratype: 1 ♀, same data (CBM).

Diagnosis. Distinguished by absence of wings, conical pronotum with wide marginal channel, short and convex elytra, and absence of anterior supraocular seta, anterior pronotal seta, and anterior and posterior discal setae. Further distinguished from most closely related *F. spinosum*, spec. nov. by not spinose elytra, denticulate sutural angles, narrower though basally comparatively wider pronotum, and slightly shorter and wider elytra.

Measurements. Length: 12.5 mm; width: 5.5 mm. Ratios. Width/length of pronotum: 1.34-1.37; width base/apex of pronotum: 1.65-1.70; width pronotum/head: 1.82-1.85; width elytra/pronotum: 1.35-1.38; length/width of elytra: 1.47-1.50.

Wing-and-seta formula: -w -+ -+ -+.

Colour. Black. Lateral margins of pronotum reddish translucent, labrum, mouth parts, antenna, and tarsi dark reddish-piceous, 1st-3rd antennomeres mostly dark. Lower surface black.

Head. Narrow compared with prothorax. Neck rather wide, somewhat imbedded in prothorax. Eyes fairly large, laterally moderately projecting, orbits distinct, evenly curved. Clypeal suture distinct. Labrum rectangular, apex feebly concave. Mandibles elongate, straight, but not porrect. Antenna elongate, surpassing base of pronotum by about three segments, median antennomeres slightly $<4 \times$ as long as wide. Both palpi elongate, basal maxillary palpomere thickened. No furrow medially of eyes, though a shallow furrow above antennal base present. Only posterior supraocular seta present, in front of posterior margin of eye. Clypeus and anterior part of frons with short, shallow, parallel furrows, frons evenly convex, absolutely smooth. Microreticulation isodiametric, distinct. Surface moderately glossy.

Prothorax. Wide, conical, widest in posterior third, laterally evenly though feebly convex, strongly narrowed to apex, very slightly narrowed to base. Disk evenly convex, lateral margins widely explanate. Anterior angles rather projecting, obtuse at apex. Apex regularly and deeply excised. Lateral margin convex throughout, not bordered, with wide, shallow marginal channel. Basal angles rectangular, obtuse only at the very apex. Base laterally straight, in middle somewhat produced. Disk convex with extremely shallow, v-shaped sulcus in apical fourth, base near basal margin with a deep, circular impression on either side and with a shallow transverse impression. Median line incomplete, fine, ending far from apex and base. Apex distinctly bordered, base not bordered. Posterior marginal seta present, situated on disk of lateral explanation far removed from posterior and lateral margins. Disk impunctate. Microreticulation very fine, though rather distinct, near apex and base isodiametric and more conspicuous than on disk, on disk consisting of fine transverse lines. Surface moderately glossy.

Elytra. Rather short and wide, dorsal surface markedly convex, lateral borders evenly rounded. Preapical sinuosity extremely feeble. Widest diameter about in middle. Shoulders wide, angulate but not dentate, apex with extremely faint, obtuse denticle opposite 3rd interval. Sutural angle with minute denticle. Striae deep, impunctate, intervals slightly convex. Anterior and posterior discal setae absent, median seta situated at 2nd stria. 18-19 marginal setae and 1 preapical seta at 7th stria present. Intervals impunctate. Microreticulation almost wanting. Surface glossy, rather iridescent. Wings absent.

Lower surface. Prosternal process short, angulate behind coxae, posteriorly markedly depressed, triangular, ventrolaterally and posterolaterally bordered. Proepisternum smooth. Mesepisternum impunctate. Metepisternum short, c. $1.2 \times$ as long as wide at anterior border. Epipleura anteriorly very wide, rugose. Abdomen impunctate, though laterally with numerous fine, elongate wrinkles and shallow impressions. Microreticulation dense, isodiametric. ♀ sternum VII quadrisetose, apex regularly curved.

Legs. Thin and elongate. 4th tarsomere medially faintly excised. 5th tarsomere asetose beneath. Vestiture of ♂ anterior tarsus unknown.

♂ genitalia. Unknown.

♀ genitalia. Stylomere 2 elongate, little curved, with obtuse apex, with 4 rather spaced ventral ensiform setae, a dorsal ensiform seta and one nematiform seta in a deep furrow moderately close to apex. Apex of stylomere 1 ventrally with c. 7 setae near base of stylomere 2. Lateral plate with 8-10 setae at or near margin.

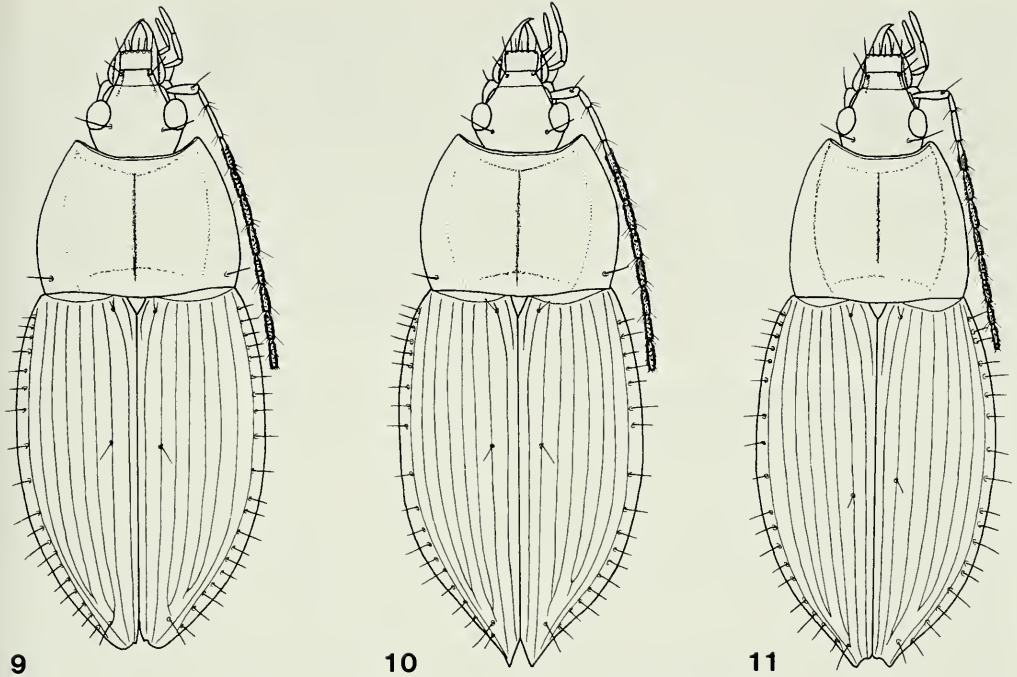
Variation. Little variation noted due to limited material. In paratype pronotum slightly more narrowed towards base and elytra more distinctly denticulate.

Distribution (Fig. 30). Eastern central Irian Jaya east of the mountain ridge on the western margin of the valley of the Borme River. Known only from type locality.

Habits. Collected in rain forest in median altitude.

Etymology. The name refers to the presence of the median discal elytral puncture only.

Relationships. Certainly very closely related to *F. spinosum*, spec. nov. but slightly more plesiomorphic.



Figs 9-11. Habitus. 9. *Fortagonum unipunctatum*, spec. nov. ♀ holotype. 10. *F. spinosum*, spec. nov. ♀ holotype. 11. *F. denticulatum*, spec. nov. ♂ holotype. Lengths: 12.5 mm, 12.8 mm, 11.2 mm.

Fortagonum spinosum, spec. nov.

Figs 8, 10, 30

Types. Holotype: ♀, IRIAN JAYA, Jayawijaya-Pr., N. Bime 2000-2070 m, 21.IX.1993, leg. A. Riedel (ZSM-CBM).

Diagnosis. Distinguished by absence of wings, conical pronotum with wide marginal channel, short and convex elytra, and absence of anterior supraocular seta, anterior pronotal seta, and anterior and posterior discal setae. Further distinguished from most closely related *F. unipunctatum*, spec. nov. by spinose elytra, not denticulate sutural angle, wider though basally comparatively narrower pronotum, and slightly longer and narrower elytra.

Description

Measurements. Length: 12.8 mm; width: 5.4 mm. Ratios. Width/length of pronotum: 1.41; width base/apex of pronotum: 1.54; width pronotum/head: 1.92; width elytra/pronotum: 1.28; length/width of elytra: 1.54.

Wing-and-seta formula: -w -+ -+ --+.

Colour. Black. Lateral margins of pronotum reddish translucent, labrum, mouth parts, antenna, and tarsi dark reddish-piceous, 1st-3rd antennomeres faintly infusate. Lower surface black.

Head. Very narrow compared with prothorax. Neck rather wide, somewhat imbedded in prothorax. Eyes fairly large, laterally moderately projecting, orbits distinct, evenly curved. Clypeal suture distinct. Labrum rectangular, apex feebly concave. Mandibles elongate, straight, but not porrect. Antenna elongate, surpassing base of pronotum by about three segments, median antennomeres slightly $>4 \times$ as long as wide. Both palpi elongate, basal maxillary palpomere thickened. No furrow medially of eyes, though a shallow furrow above antennal base present. Only posterior supraocular seta present, on same level with posterior margin of eye. Clypeus and anterior part of frons with short, shallow, parallel

Prothorax. Wide, rather conical, widest in posterior two fifth, laterally evenly though feebly convex, strongly narrowed to apex, fairly narrowed to base. Disk evenly convex, lateral margins widely explanate. Anterior angles rather projecting, obtuse at apex. Apex regularly and deeply excised. Lateral margin convex throughout, not bordered, with wide, shallow marginal channel. Basal angles about rectangular, obtuse only at the very apex. Base laterally straight, in middle somewhat produced. Disk convex with extremely shallow, v-shaped sulcus in apical fourth, base near basal margin with a deep, circular impression on either side and with a shallow transverse impression. Median line incomplete, fine, ending far from apex and base. Apex distinctly bordered, base not bordered. Posterior marginal seta present, situated on disk of lateral explanation far removed from posterior and lateral margins. Disk impunctate. Microreticulation very fine, though rather distinct, near apex and base isodiametric and more conspicuous than on disk, on disk consisting of fine transverse lines. Surface moderately glossy.

Elytra. Rather short and wide, dorsal surface markedly convex, lateral borders evenly rounded. Preapical sinuosity extremely feeble. Widest diameter about in middle. Shoulders wide, angulate but not dentate, apex with rather elongate, acute, slightly upturned spine opposite 3rd interval. Sutural angle without denticle. Striae deep, impunctate, intervals slightly convex. Anterior and posterior discal setae absent, median seta situated at 2nd stria. 18-19 marginal setae and 1 preapical seta at 7th stria present. Intervals impunctate. Microreticulation almost wanting. Surface glossy, rather iridescent. Wings absent.

Lower surface. Prosternal process short, angulate behind coxae, posteriorly markedly depressed, triangular, ventrolaterally and posterolaterally bordered. Proepisternum smooth. Mesepisternum coarsely but superficially punctate. Metepisternum rather short, c. $1.3 \times$ as long as wide at anterior border. Epipleura anteriorly very wide, rugose. Abdomen impunctate, though laterally with numerous fine, elongate wrinkles and shallow impressions. Microreticulation dense, isodiametric. ♀ sternum VII quadrisetose, apex regularly curved.

Legs. Thin and elongate. 4th tarsomere medially faintly excised. 5th tarsomere asetose beneath. Vestiture of ♂ anterior tarsus unknown.

♂ genitalia. Unknown.

♀ genitalia. Stylomere 2 elongate, little curved, with obtuse apex, with 3 rather spaced ventral ensiform setae, a dorsal ensiform seta and one nematiform seta in a deep furrow moderately close to apex. Apex of stylomere 1 ventrally with c. 8 setae near base of stylomere 2. Lateral plate with 7-8 setae at or near margin.

Variation. Unknown.

Distribution (Fig. 30). Eastern central Irian Jaya west of the mountain ridge on the western margin of the valley of the Borme River. Known only from type locality.

Habits. Collected in rain forest in median altitude.

Etymology. The name refers to the markedly spinose apex of the elytra.

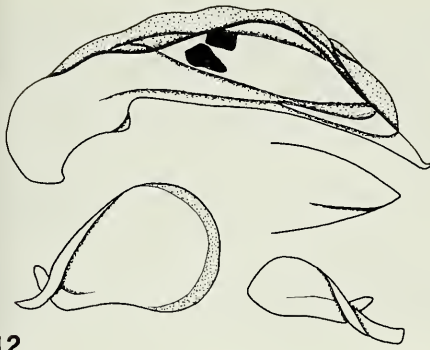
Relationships. Certainly very closely related to *F. unipunctatum*, spec. nov., but slightly more apomorphic. The decision, whether this is actually a separate species or merely a subspecies of *F. unipunctatum* will not be solved until males of both taxa are available.

Fortagonum denticulatum, spec. nov.

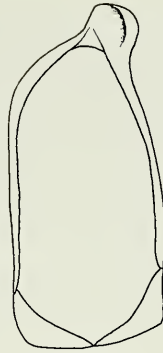
Figs 11-13, 30

Types. Holotype: ♂, IRIAN JAYA, Jayawijaya-Pr., Bime 1600-1900 m, 11.IX.1993, leg. A. Riedel (ZSM-CBM). - Paratype: 1 ♀, IRIAN JAYA, Jayawijaya-Pr., Galbok (w. Nalca), 1700-1800 m, 3.X.1993, leg. A. Riedel (CBM).

Diagnosis. Distinguished by presence of wings, rather narrow, conical pronotum with wide marginal channel, fairly elongate, convex elytra, and absence of anterior supraocular seta, both pronotal seta, and anterior and posterior discal setae.



12



13

Figs 12, 13. *Fortagonum denticulatum*, spec. nov. 12. ♂ aedeagus, apex of aedeagus, parameres, and genital ring. 13. ♀ stylomeres.

Description

Measurements. Length: 11.2-11.5 mm; width: 4.6-4.7 mm. Ratios. Width/length of pronotum: 1.32-1.34; width base/apex of pronotum: 1.53-1.60; width pronotum/head: 1.76-1.89; width elytra/pronotum: 1.31-1.32; length/width of elytra: 1.58-1.59.

Wing-and-seta formula: +w -+ - -+-.

Colour. Glossy black. Lateral margins of pronotum reddish translucent, labrum, mouth parts, antenna, and tarsi dark reddish-piceous, 1st-3rd antennomeres more or less infuscate. Lower surface black.

Head. Moderately narrow compared with prothorax. Neck rather wide, somewhat imbedded in prothorax. Eyes fairly large, laterally moderately projecting, orbits distinct, evenly curved. Clypeal suture distinct. Labrum rectangular, apex feebly concave. Mandibles elongate, straight, but not correct. Antenna elongate, surpassing base of pronotum by about three segments, median antennomeres c. 3-3.5 × as long as wide. Both palpi elongate, basal maxillary palpomere thickened. No furrow medially of eyes, though a shallow furrow above antennal base present. Only posterior supraocular seta present, at posterior margin of eye. Clypeus and anterior part of frons with short, shallow, parallel furrows, frons evenly convex, absolutely smooth. Microreticulation isodiametric, somewhat superficial. Surface glossy.

Prothorax. Moderately wide, conical, widest in posterior third, laterally evenly though feebly convex, strongly narrowed to apex, moderately narrowed to base. Disk evenly convex, lateral margins widely explanate. Anterior angles rather projecting, obtuse at apex. Apex regularly and deeply excised. Lateral margin convex throughout, not bordered, with wide, shallow marginal channel. Basal angles rectangular, at apex obtusely rounded. Base laterally straight, in middle very faintly produced. Disk convex with extremely shallow, v-shaped sulcus in apical fourth, base near basal margin with a deep, circular impression on either side and with a very shallow transverse impression. Median line incomplete, fine, ending far from apex and base. Apex distinctly bordered, base not bordered. Both marginal setae absent. Disk impunctate. Microreticulation very fine, on disk highly superficial, near apex and base isodiametric and more conspicuous, on disk consisting of very fine transverse lines. Surface glossy.

Elytra. Rather narrow and elongate, dorsal surface markedly convex, lateral borders in middle almost straight. Preapical sinuosity extremely feeble. Widest diameter about in middle. Shoulders wide, angulate but not dentate, apex with short triangular spine opposite 3rd interval. Sutural angle with minute denticle. Striae deep, impunctate, intervals slightly convex. Anterior and posterior discal setae absent, median seta situated at 2nd stria. 18 marginal setae and 1 preapical seta at 7th stria present. Intervals impunctate. Microreticulation almost wanting. Surface highly glossy, rather iridescent. Wings present.

Lower surface. Prosternal process short, obtusely dentate behind coxae, posteriorly markedly depressed, triangular, ventrolaterally and posterolaterally bordered. Proepisternum smooth. Mesepister-

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num coarsely punctate. Metepisternum moderately elongate, c. 1.5 × as long as wide at anterior border. Epipleura anteriorly moderately wide, rugose. Abdomen impunctate, though laterally with several fine, elongate wrinkles and shallow impressions. Microreticulation dense, isodiametric, very superficial. ♂ sternum bisetose, in middle excised, ♀ sternum VII quadrisetose, apex regularly curved.

Legs. Thin and elongate. 4th tarsomere medially faintly excised. 5th tarsomere asetose beneath. 1st-3rd tarsomeres of ♂ anterior tarsus biserially squamose.

♂ genitalia. Genital ring rather parallel, at apex asymmetric. Aedeagus stout, slightly curved, lower surface almost straight. Apex short and acute, with very small terminal hook. Lower surface near apex with a short carina. Internal sac in middle at top on either side with a small, odd-shaped, sclerotized plate. Left paramere very wide, almost circular.

♀ genitalia. Stylomere 2 elongate, little curved, with obtuse apex, with 3 large ventral ensiform setae, a dorsal ensiform seta and one nematiform seta in a deep furrow moderately close to apex. Apex of stylomere 1 ventrally with c. 6 setae near base of stylomere 2. Lateral plate with 3-4 setae at or near margin.

Variation. Little variation noted due to limited material, though pronotum varies slightly in shape and relative width.

Distribution (Fig. 30). Eastern central Irian Jaya.

Habits. Collected in rain forest in median altitude.

Relationships. This species is rather closely related to *F. unipunctatum*, spec. nov. and *F. spinosum*, spec. nov., but is slightly more apomorphic than both species.

Etymology. The name refers to the denticulate apex of the elytra.

Fortagonum depressum, spec. nov.

Figs 14, 17, 31

Types. Holotype: ♂, IRIAN JAYA, Manokwari-Prov. Testega-Meydoudga, 1000-1350 m, 10.IV.1993, leg. A. Riedel (ZSM-CBM). - Paratype: 1 ♀, Irian Jaya, Pr. Manokwari, Iba, 1300 m, 7.-8.4.1993, leg. A. Riedel (CBM).

Diagnosis. Distinguished by presence of wings, rather narrow, faintly conical pronotum with wide marginal channel, fairly elongate, convex elytra with slightly crenulate striae and depressed intervals, presence of a short spine opposite 3rd interval, and absence of both supraocular setae, both pronotal setae, and the anterior discal seta.

Description

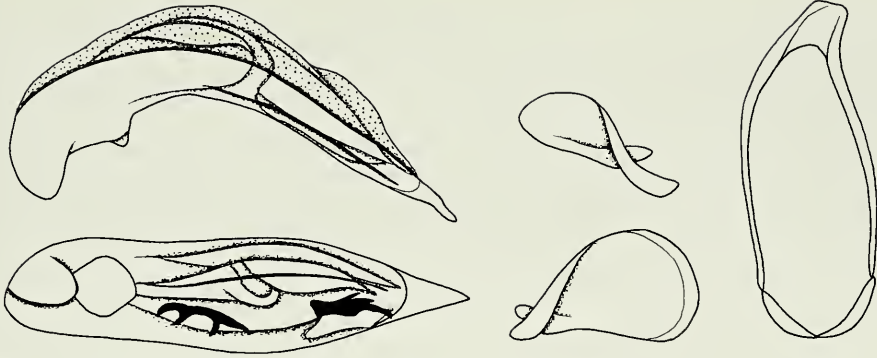
Measurements. Length: 10.7-11.4 mm; width: 4.35-4.60 mm. Ratios. Width/length of pronotum: 1.44-1.48; width base/apex of pronotum: 1.63; width pronotum/head: 1.87-1.91; width elytra/pronotum: 1.28-1.32; length/width of elytra: 1.62-1.65.

Wing-and-seta formula: +w — — -++.

Colour. Iridescent black. Lateral margins of pronotum reddish translucent, labrum, mouth parts, antenna, and tarsi dark reddish-piceous, tibiae piceous, 1st-3rd antennomeres more or less infuscate. Lower surface black.

Head. Moderately narrow compared with prothorax. Neck rather wide, somewhat imbedded in prothorax. Eyes fairly large, laterally moderately projecting, orbits distinct, evenly curved. Clypeal suture distinct. Labrum rectangular, apex feebly concave. Mandibles elongate, straight, but not porrect. Antenna elongate, surpassing base of pronotum by about three segments, median antennomeres c. 4 × as long as wide. Both palpi elongate, basal maxillary palpomere thickened. No furrow medially of eyes, though a shallow furrow above antennal base present. No supraocular setae present. Clypeus and anterior part of frons with short, shallow, parallel furrows, inside of eyes with few elongate, fine though sharp lines, frons evenly convex. Microreticulation isodiametric, highly superficial, surface with sparse and extremely fine puncturation, glossy.

Prothorax. Moderately wide, conical, widest in posterior third, laterally evenly though feebly convex, strongly narrowed to apex, moderately narrowed to base. Disk evenly convex, lateral margins widely explanate. Anterior angles markedly projecting, obtuse at apex. Apex regularly and deeply



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Fig. 14. *Fortagonum depressum*, spec. nov. ♂ aedeagus, parameres, and genital ring.

excised. Lateral margin convex throughout, not bordered, with wide, shallow marginal channel. Basal angles rectangular, at apex obtusely rounded. Base laterally straight, in middle very faintly produced. Disk convex with shallow, v-shaped sulcus in apical fourth, base near basal margin with a deep, circular impression on either side and with a very shallow transverse impression. Median line incomplete, fine, ending far from apex and base. Apex distinctly bordered, base not bordered. Both marginal setae absent. Disk impunctate, though with some fine, transverse wrinkles, in marginal channel and especially around basal grooves with irregular, rugose wrinkles. Microreticulation very fine, on disk highly superficial, near apex and base isodiametric and more conspicuous. Surface glossy apart from the rugose parts.

Elytra. Rather narrow and elongate, dorsal surface markedly convex, lateral borders in middle almost straight. Preapical sinuosity extremely feeble. Widest diameter about in middle. Shoulders wide, angulate but not dentate, apex with short triangular spine opposite 3rd interval that is slightly curved inwards. Sutural angle without denticle. Striae deep, faintly crenulate, intervals markedly depressed. Anterior discal seta absent, median seta situated on 3rd interval, posterior seta at 2nd stria. 17-19 marginal setae and 1 preapical seta at 7th stria present. Intervals impunctate. Microreticulation absent. Surface highly glossy, rather iridescent. Wings present.

Lower surface. Prosternal process short, evenly rounded behind coxae, posteriorly markedly depressed, triangular, ventrolaterally and posterolaterally bordered. Proepisternum finely, transversely striolate, distinctly microreticulate, dull. Mesepisternum densely and coarsely punctate. Metepisternum moderately elongate, c. $1.5 \times$ as long as wide at anterior border, coarsely punctate. Epipleura anteriorly moderately wide, very rugose. Abdomen impunctate, though laterally with several fine, elongate wrinkles and shallow impressions. Microreticulation strong, dense, isodiametric. ♂ sternum bisetose, apex in middle excised, ♀ sternum VII quadrisetose, apex regularly curved.

Legs. Thin and elongate. 4th tarsomere medially faintly excised. 5th tarsomere asetose beneath. 1st-3rd tarsomeres of ♂ anterior tarsus biserially squamose.

♂ genitalia. Genital ring narrow, rather parallel, at apex asymmetric. Aedeagus moderately elongate, rather curved, lower surface gently bisinuate, with elongate median carina on upper surface and a lateral carina on either margin, surface in cross-section triangular. Apex rather elongate, acute, with extremely small terminal knob. Internal sac on left side at bottom with two strongly sclerotized, denticulate plates or groups of plates, respectively, one tridentate plate in front, two closely adjacent unidentate plates behind middle. Left paramere very wide, almost circular.

♀ genitalia. Unknown, since in the single ♀ the apex of the abdomen is damaged.

Variation. Little variation noted due to limited material.

Distribution (Fig. 31). Vogelkop, extreme western Irian Jaya.

Habits. Collected in rain forest in median altitude.

Relationships. This species is rather remotely related to the three preceding species.

Etymology. The name refers to the markedly depressed elytral intervals.

Fortagonum Darlington, 1952 (part), p. 247.

Fortagonum, Darlington 1971 (part), p. 316, figs 75-76.

Fortagonum, Baehr 1992 (part), p. 74, figs 2, 3, 5, 6.

Diagnosis. The genus is characterized by the presence of a deep sulcus medially of the eyes, the wide, distorted pronotum with wide, explanate lateral margins, rather elongate, parallel, apically not spined or dentate elytra, the characteristic aedeagus with elongate, markedly sclerotized, curved, rod-like apex, the comparatively short ♀ stylomere, and the following wing-and-seta formula:

+w-w -+ +- -(+) +- +- +-

Description

Genus of Agoninae, delimited by the following character states: Colour black, almost always with bluish or purplish hue on the elytra. Head rather elongate with long, wide neck, moderately large, usually distinctly protruding eyes, a deep sulcus medially of eyes that completely divides the eye from frons, and elongate, though not porrect mandibles. Mentum with very elongate, acute median tooth. Other mouthparts like in related genera, but penultimate segments of both palpi shorter than in *Fortagonum*. Antenna moderately elongate, median segments usually <3 × as long as wide. Prothorax wide, distorted, laterally evenly rounded, with wide, markedly explanate lateral margins, shortly angulate or obtuse basal angles, and deeply excised apex. Elytra usually rather elongate, parallel, with evenly rounded shoulders, rounded, not denticulate nor spinose apex, and weak preapical sinuosity. Elytral striae deep, smooth, intervals convex. Marginal channel with 20-21 lateral setae, two apical setae and one preapical seta near 7th stria, disk with 3 or 0 setae, in latter case very rarely the median seta unilaterally present. Fully winged or wings shortened. In winged species metepisternum c. 2.5 × as long as wide, in species with reduced wings <2 × as long as wide. Prosternal process very short, rounded, behind procoxae depressed. Legs elongate, 5th tarsomeres aetose beneath, claws large, smooth. ♂ sternum VII evenly rounded at apex, bisetose. Aedeagus elongate, markedly curved, apex extended in an elongate, curved, strongly sclerotized rod with acute apex. Orificium very elongate, without sclerotized teeth within. ♀ stylomere 1 with some elongate setae at apex, stylomere 2 moderately elongate, dentiform, slightly curved, with 2-3 ventro-lateral ensiform setae, a dorsomedian ensiform seta, and an apical nematiform seta originating in a groove.

Distribution. Central Papua New Guinea, eastern central Irian Jaya, both New Guinea. The species inhabit montane rain forest in median altitudes and are mainly collected under logs and by sieving leaf litter.

Type species: *Fortagonum laticolle* Baehr, 1992, by present designation.

Etymology. From latin *collum* = neck, and *Agonum*. The name refers to the conspicuous shape of the pronotum.

The genus includes thus far the following species: *Collagonum linum* (Darlington, 1952), *C. horna-brooki* (Darlington, 1971), *C. distortum* (Darlington, 1971), *C. laticolle* (Baehr, 1992), and *C. ophthalmicum* (Baehr, 1992), as well as the four new species and one new subspecies described below.

Key to the species of the genus *Collagonum*, gen. nov.

1. Wings present 2.
- Wings absent 7.
2. Both pairs of supraocular setae absent 3.
- At least posterior supraocular seta present 5.
3. Eyes laterally abruptly produced; pronotum at apex much narrower than at base. Central Irian Jaya *ophthalmicum* (Baehr)
- Eyes laterally not as abruptly produced; pronotum at apex only slightly narrower than at base 4.

4. Both pronotal setae absent. Eastern Irian Jaya *robustum*, spec. nov.
 – Posterior pronotal seta present. Eastern Irian Jaya *riedeli*, spec. nov.
5. Wider species; pronotum wider, laterally more rounded, with shorter, more convex anterior angles. Central Papua New Guinea *violaceum*, spec. nov.
 – Narrower species; pronotum narrower, laterally less rounded, with longer, more acute anterior angles. Central and eastern Irian Jaya *laticolle* (Baehr) 6.
6. Eyes smaller, laterally more abruptly protruding, almost devoid of distinct orbits (Fig. 15). Area west of mountain range to the west of valley of Borme River *laticolle laticolle* (Baehr)
 – Eyes larger, laterally less abruptly protruding, with distinct, oblique orbits (Fig. 16). Area east of mountain range to the west of valley of Borme River *laticolle macrops*, subspec. nov.
7. Eyes laterally abruptly produced; elytra asetose, or (rarely) unilaterally unisetose 8.
 – Eyes laterally not as abruptly produced; elytra trisetose 9.
8. Both supraocular setae present; posterior pronotal seta present; frons conspicuously swollen. Central Papua New Guinea *distortum* (Darlington)
 – Anterior supraocular seta absent; posterior pronotal seta absent; frons not swollen. Central Papua New Guinea *limum* (Darlington)
9. Both supraocular setae present; prothorax narrower, $<1.5 \times$ as wide as long. Central eastern Irian Jaya *convexum*, spec. nov.
 – Anterior supraocular seta absent; prothorax wider, c. $1.7 \times$ as wide as long. Central Papua New Guinea *hornabrooki* (Darlington)

***Collagonum laticolle* (Baehr) (comb. nov.)**

Fortagonum laticolle Baehr, 1992, p. 77, figs 2, 5.

Diagnosis. Elongate, violaceous species with wide, laterally markedly convex, distorted pronotum. Distinguished from related species by presence of wings and absence of anterior supraorbital seta and anterior pronotal seta, and from the most closely related *C. violaceum*, spec. nov. by narrower pronotum with longer, more acute anterior angles, and longer and narrower elytra.

This species was described from a single female from central Irian Jaya. Because males have been now discovered, the ♂ genitalia are herewith described.

Newly collected material reveals that the species includes two slightly different subspecies in two closely adjacent areas, divided only by a mountain range west to the Borme river. They are mainly distinguished by the larger, though laterally less abruptly protruding eyes, the slightly more rounded anterior angles of the pronotum, and the slightly wider elytra in the new subspecies *C. laticolle macrops*.

***Collagonum laticolle laticolle* (Baehr) (comb. nov.)**

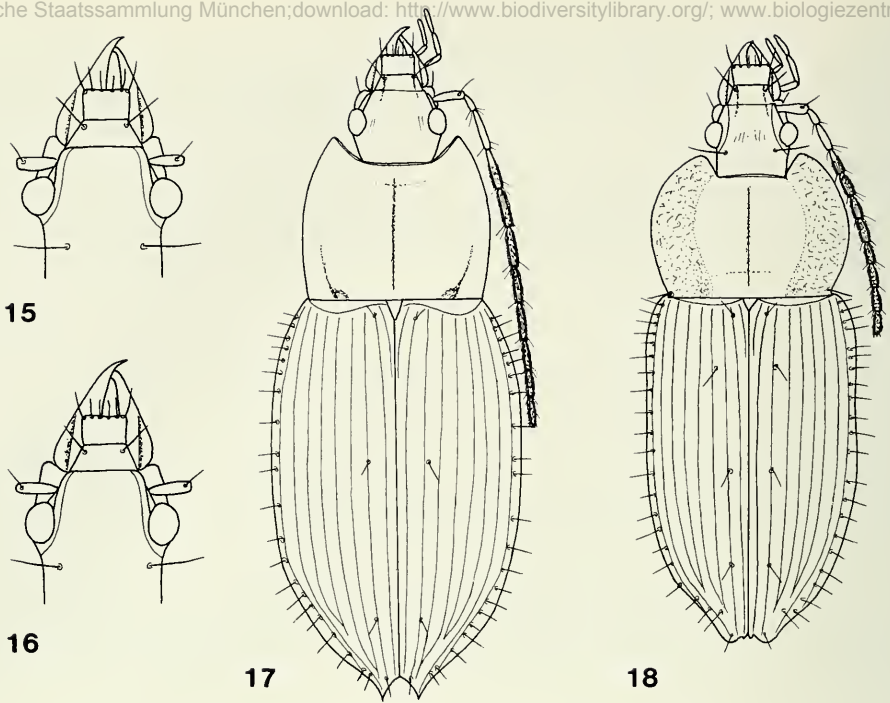
Figs 15, 19, 30

Fortagonum laticolle Baehr, 1992, p. 77, figs 2, 5.

New records: 1 ♂, Irian Jaya, Jayawijaya Prov., Diuremna, 1900-2100 m, 9.-11.9.1992, leg. A. Riedel (CBM); 1 ♂, IRIAN JAYA, Jayawijaya-Pr., Bime 1600-1900 m, 11.IX.1993, leg. A. Riedel (CBM); 1 ♂, IRIAN JAYA, Jayawijaya-Pr., Gabok (W. Nalca) 1700-1800 m, 3.X.1993, leg. A. Riedel (CBM); 1 ♂, IRIAN JAYA, Panai-Prov., Mulia (n) to Dowome, 2200-2250 m, 8.VII.1994, leg. A. Riedel (CBM).

Description of some additional characters

Measurements. Length: 11.2-12.1 mm; width: 4.15-4.70 mm. Ratios. Width/length of pronotum: 1.50-1.57; width base/apex of pronotum: 1.49-1.55; width pronotum/head: 1.80-1.86; width elytra/pronotum: 1.15-1.19; length/width of elytra: 1.62-1.69.



Figs 15, 16. Head. 15. *Collagonum laticolle laticolle* (Baehr). 16. *C. laticolle macrops*, subspec. nov.
Figs 17, 18. Habitus. 17. *Fortagonum depressum*, spec. nov. ♂ holotype. 18. *Collagonum violaceum*, spec. nov. Lengths:
10.7 mm, 12.3 mm.

♂ genitalia. Sternum VII bisetose and at apex regularly rounded. Genital ring fairly wide, moderately asymmetric, apex narrow, fairly short. Aedeagus slightly curved, apical part extended to an elongate, strongly sclerotized rod that is down-turned in a very weak though still visible angle. Apex with acute, lancet-shaped tip without lateral hooks. Internal sac without sclerotized plates or teeth. Both parameres rather elongate, right paramere at apex rather convex.

Variation. Some sexual variation noted within the nominate subspecies, because the males are comparatively longer and narrower, especially concerning their elytra.

Distribution (Fig. 30). Eastern central Irian Jaya west of the mountain ridge on the western margin of the valley of the Borme River. The new records enlarge the recorded range of this species slightly eastwards and westwards through the central highlands of Irian Jaya.

Note. In the original description of this species the wing-and-seta formula must be read +w instead of erroneous -w (misprint!), because the species is fully winged as mentioned in the key and the description.

Collagonum laticolle macrops, subspec. nov.

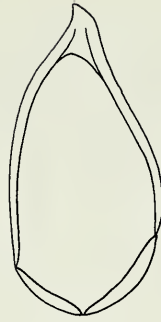
Figs 16, 20, 30

Types. Holotype: ♂, Irian Jaya, Jayawijaya Prov., Borme, 1500-2000 m, 14.8.1992, leg. A. Riedel (ZSM). - Paratypes: 3♂♂, 1♀, same data (CBM); 2♀♀, Irian Jaya, Jayawijaya Prov., Taramlu, 1700 m, 6.IX.1993, leg. A. Riedel (CBM).

Diagnosis. Distinguished from the nominate subspecies by larger, though laterally less abruptly protruding eyes, slightly more rounded anterior angles of the pronotum, and slightly wider elytra.



19



20

Figs 19, 20. Genitalia. 19. *Collagonum laticolle laticolle* (Baehr). ♂ aedeagus, apex of aedeagus, parameres, and genital ring. 20. *C. laticolle macrops*, subspec. nov. ♀ stylomeres.

Description

Measurements. Length: 11.5-12.5 mm; width: 4.4-4.7 mm. Ratios. Width/length of pronotum: 1.46-1.55; width base/apex of pronotum: 1.52-1.56; width pronotum/head: 1.73-1.83; width elytra/pronotum: 1.15-1.22; length/width of elytra: 1.65-1.70.

Wing-and-seta formula: +w -+ -+ + + +.

Colour. Similar to nominate subspecies.

Head. Largely similar to nominate subspecies, though eyes larger, but not so abruptly projecting, and sulcus medially of eyes less deep.

Prothorax. Largely similar to nominate subspecies, though generally slightly narrower and with slightly less protruding anterior angles.

Elytra. Largely similar to nominate subspecies, though generally slightly wider and shorter.

Lower surface. Similar to nominate subspecies.

Legs. Similar to nominate subspecies.

♂ genitalia. Similar to nominate subspecies.

♀ genitalia. Stylomere 2 moderately elongate, slightly curved, with obtuse apex, with 2 ventral ensiform setae, a dorsal ensiform seta and one nematiform seta in a deep furrow rather close to apex. Apex of stylomere 1 ventrally with c. 9 setae near base of stylomere 2. Lateral plate with c. 4 setae at or near margin.

Variation. Little variation noted.

Distribution (Fig. 30). Eastern central Irian Jaya east of the mountain ridge on the western margin of the valley of the Borme River.

Habits. Collected in rain forest in median altitude.

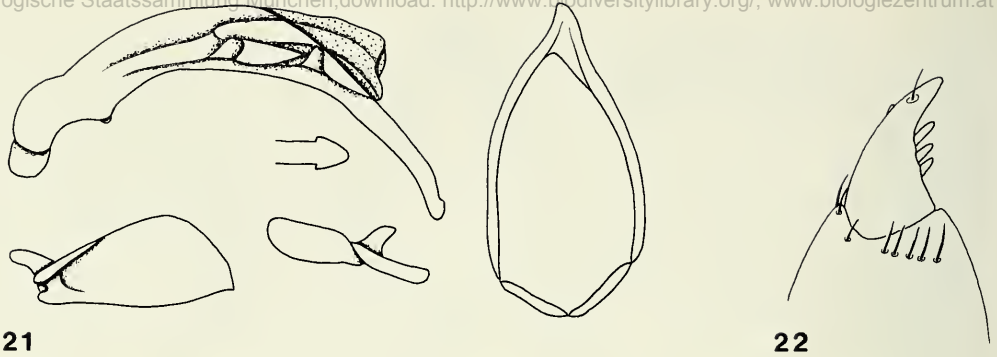
Etymology. The name refers to the larger, though less abruptly projecting eyes of this subspecies.

Collagonum violaceum, spec. nov.

Figs 18, 21, 22, 31

Types. Holotype: ♂, PNG, Morobe Pr. Aseki, 1500-1650 m, 14.9.1992, leg. A. Riedel (ZSM). - Paratypes: 2♂♂, 2♀♀, same data (CBM).

Diagnosis. Elongate, violaceous species with wide, laterally markedly convex, distorted pronotum. Distinguished from related species by presence of wings and absence of anterior supraorbital seta and anterior pronotal seta, and from the most closely related *C. laticolle* (Baehr) by wider pronotum with shorter, more rounded anterior angles, and shorter and wider elytra.



Figs 21, 22. *Collagonum violaceum*, spec. nov. 21. ♂ aedeagus, apex of aedeagus, parameres, and genital ring. 22. ♀ stylomeres.

Description

Measurements. Length: 12.1-12.7 mm; width: 4.6-4.8 mm. Ratios. Width/length of pronotum: 1.68-1.75; width base/apex of pronotum: 1.61-1.68; width pronotum/head: 2.0-2.03; width elytra/pronotum: 1.06-1.09; length/width of elytra: 1.60-1.62.

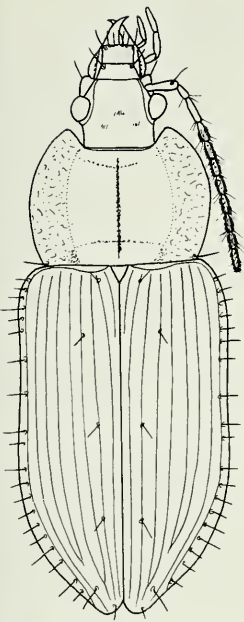
Wing-and-seta formula: +w -+ -+ +++.

Colour. Black with a distinct violet-blue iridescence on the elytra. Lateral borders of pronotum reddish translucent, labrum, mouth parts, antenna, and tarsi dark piceous. 1st-3rd antennomeres more or less distinctly infuscate. Lower surface black.

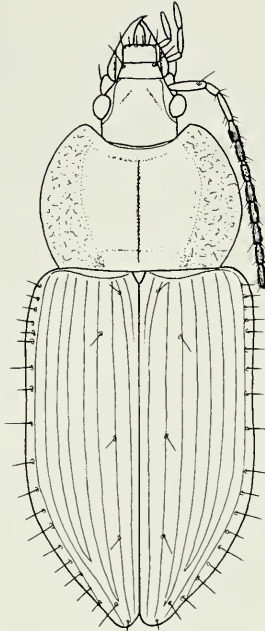
Head. Narrow compared with prothorax. Neck rather narrow, elongate behind eyes. Eyes rather large, strongly, though not abruptly protruding, orbits almost absent. Clypeal suture distinct. Labrum moderately elongate, apex straight. Mandibles moderately elongate, straight. Antenna moderately elongate, surpassing base of pronotum by about two segments, median antennomeres <math><3\times</math> as long as wide. Both palpi elongate, basal maxillary palpomere thickened. Furrow above antennal base and inside of eyes deep, conspicuous. Anterior supraocular seta absent, posterior seta situated slightly behind posterior margin of eye. Frons rather evenly convex, impunctate, laterally with a shallow groove that is crossed by some oblique wrinkles. Microreticulation extremely superficial, isodiametric. Surface glossy.

Prothorax. Very wide, laterally very broadly deplanate, evenly curved, much more evenly narrowed to apex than to base. Widest diameter about in middle. Anterior angles remarkably projecting, at apex widely rounded off. Apex deeply excised, excision almost straight. Lateral margin convex to basal angles which bear a very small denticle. Base laterally straight, in middle feebly produced. Disk fairly convex, lateral parts broadly deplanate, slightly upturned. In anterior third with a shallow, slightly v-shaped depression, median line distinct, attaining neither apex nor base, base with a shallow transverse depression. Basal grooves deep, large, about circular. Apex bordered, lateral margins not bordered, base bordered in middle. Anterior marginal seta absent, posterior marginal seta situated right on posterior angle. Lateral channel and basal grooves coarsely and irregularly punctate-vermiculate, though punctures rather superficial. Disk impunctate, almost smooth. Microreticulation near apex and base about isodiametric, in middle extremely superficial, barely visible, consisting of extremely fine transverse lines. Surface on disk glossy, rather iridescent.

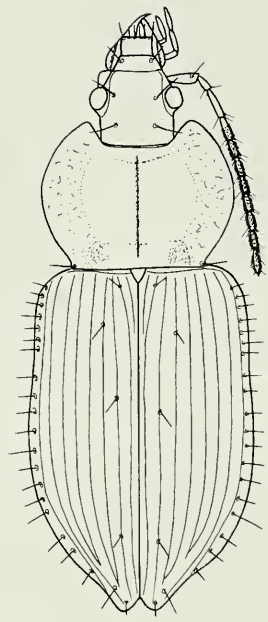
Elytra. Elongate, moderately wide, rather parallel, dorsal surface convex, lateral borders almost straight in anterior $\frac{3}{5}$, behind shoulders even faintly concave, towards apex evenly rounded. Widest diameter well behind middle. Preapical sinuosity rather shallow. Shoulders wide, rounded. Apex with a short, rounded projection opposite 3rd interval. Sutural angle with a very small denticle. Striae deep, impunctate, intervals convex. Discal setae short, inconspicuous, anterior seta near 3rd stria, median and posterior setae near 2nd stria. 20-21 marginal setae and 3 apical setae present, two of the latter situated on apical border, one near 7th stria. Intervals impunctate. Microreticulation very superficial, consisting of extremely fine, dense, transverse lines. Surface markedly iridescent. Fully winged.



23



24



25

Figs 23-25. Habitus. 23. *Collagonum riedeli*, spec. nov. 24. *C. robustum*, spec. nov. 25. *C. convexum*, spec. nov. Lengths: 11.5 mm, 12.0 mm, 11.5 mm.

Lower surface. Prosternum very short, not surpassing procoxae, rounded off, posteriorly depressed, ventrally bordered. Proepisternum almost impunctate, with dense microreticulation. Mesepisternum rather densely, though somewhat superficially punctate. Metepisternum elongate, c. 2.5 × as long as wide at anterior border. Epipleura anteriorly moderately wide, posteriorly very narrow, moderately rugose. Abdomen impunctate, though laterally with some fine wrinkles. Microreticulation very distinct, isodiametric. ♂ sternum VII bisetose, ♀ sternum VII quadrisetose, in one ♀ even asymmetrically 6-setose, apex evenly rounded in both sexes.

Legs. Rather thin and elongate. 5th tarsomere asetose beneath. 4th tarsomere medially slightly excised. 1st-3rd tarsomeres of ♂ anterior tarsus biserially squamose.

♂ genitalia. Genital ring moderately narrow, fairly symmetric, apex narrow, rather short. Aedeagus slightly curved, apical part extended to an elongate, strongly sclerotized rod that is downcurved without a distinct angle. Apex with obtusely convex, lancet-shaped tip with small lateral hooks. Internal sac without sclerotized plates or teeth. Both parameres rather elongate.

♀ genitalia. Stylomere 2 moderately elongate, slightly curved, with obtuse apex, with 3 ventral ensiform setae, a dorsal ensiform seta and one nematiform seta in a deep furrow moderately close to apex. Apex of stylomere 1 ventrally with c. 8 setae near base of stylomere 2. Lateral plate with c. 4 setae at or near margin.

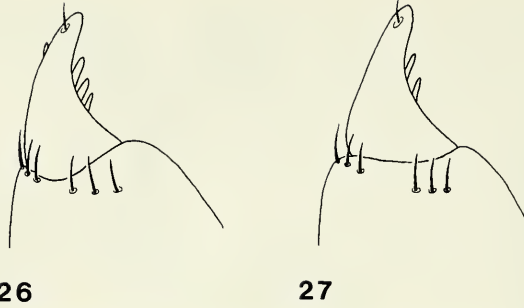
Variation. Little variation noted.

Distribution (Fig. 31). Eastern central Papua New Guinea. Known only from type locality.

Habits. Collected in rain forest in median altitude.

Relationships. This species is certainly most closely related to the western *C. laticolle* (Baehr), though it is in some respects slightly less apomorphic.

Etymology. The name refers to the distinct violaceous tint of the elytra.



Figs 26, 27. ♀ stylomeres. 26. *Collagonum riedeli*, spec. nov. 27. *C. convexum*, spec. nov.

Collagonum riedeli, spec. nov.

Figs 23, 26, 30

Types. Holotype: ♀, Irian Jaya, Jayawijaya-Pr., Bommela, 1750 m, 30.8.-1.9.1992, leg. A. Riedel (ZSM). - Paratype: 1 ♀, same data (CBM).

Diagnosis. Elongate, violaceous species with wide, laterally markedly convex, distorted pronotum. Distinguished from related species by presence of wings and absence of both supraorbital seta and the anterior pronotal seta.

Description

Measurements. Length: 11.5-11.9 mm; width: 4.3-4.5 mm. Ratios. Width/length of pronotum: 1.55; width base/apex of pronotum: 1.53-1.56; width pronotum/head: 1.79-1.88; width elytra/pronotum: 1.16-1.19; length/width of elytra: 1.60-1.63.

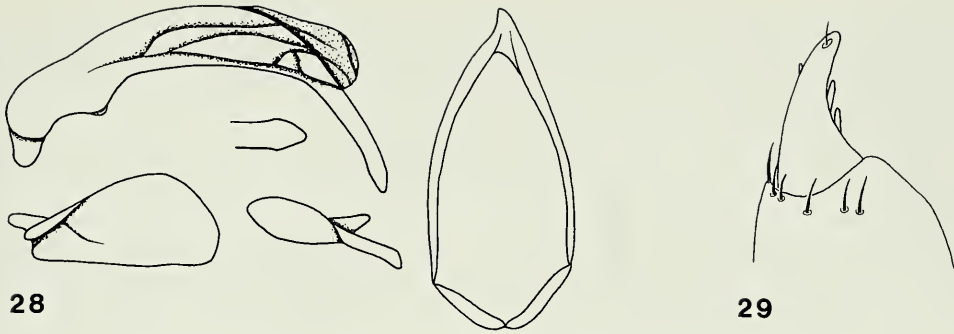
Wing-and-seta formula: +w — —+ + + +.

Colour. Black with slight violet-blue iridescence on the elytra. Lateral borders of pronotum reddish translucent, labrum, mouth parts, antenna, and tarsi dark piceous. 1st-3rd antennomeres more or less distinctly infusate. Lower surface black.

Head. Rather narrow compared with prothorax. Neck rather narrow, elongate behind eyes. Eyes rather large, strongly, though not abruptly protruding, orbits almost absent. Clypeal suture distinct. Labrum moderately elongate, apex straight. Mandibles moderately elongate, straight. Antenna moderately elongate, surpassing base of pronotum by about one segment, median antennomeres c. 2.5 × as long as wide. Both palpi elongate, basal maxillary palpomere thickened. Furrow above antennal base and inside of eyes deep, conspicuous. Both supraocular setae absent. Frons rather evenly convex, impunctate, in middle with a very slight, triangular impression, laterally with a very shallow groove. Microreticulation distinct, isodiametric. Surface moderately glossy.

Prothorax. Wide, laterally broadly deplanate, laterally evenly curved, much more narrowed to apex than to base. Widest diameter about in middle. Anterior angles remarkably projecting, at apex rounded off. Apex deeply excised, excision almost straight. Lateral margin convex to basal angles which bear a very small denticle. Base laterally straight, in middle feebly produced. Disk fairly convex, lateral parts broadly deplanate, slightly upturned. In anterior fourth with a shallow, slightly v-shaped depression, median line distinct, attaining neither apex nor base, base with a shallow transverse depression. Basal grooves deep, large, about circular. Apex bordered, lateral margins not bordered, base bordered in middle. Anterior marginal seta absent, posterior marginal seta situated right on posterior angle. Lateral channel and basal grooves coarsely and irregularly punctate-vermiculate, though punctures superficial. Disk impunctate, almost smooth. Microreticulation near apex and base about isodiametric, in middle rather superficial, consisting of very fine transverse lines. Surface on disk glossy, rather iridescent.

Elytra. Elongate, moderately wide, almost parallel, dorsal surface convex, lateral borders almost straight in anterior $\frac{3}{5}$, behind shoulders even faintly concave, towards apex evenly rounded. Widest diameter well behind middle. Preapical sinuosity rather shallow. Shoulders wide, rounded. Apex with



Figs 28, 29. *Collagonum robustum*, spec. nov. 28. ♂ aedeagus, apex of aedeagus, parameres, and genital ring. 29. ♀ stylomeres.

a short, rounded projection opposite 3rd interval. Sutural angle without denticle. Striae deep, impunctate, intervals convex. Discal setae short, inconspicuous, anterior seta near 3rd stria, median and posterior setae near 2nd stria. 20 marginal setae and 3 apical setae present, two of the latter situated on apical border, one near 7th stria. Intervals impunctate. Microreticulation highly superficial, consisting of extremely fine, dense, transverse lines. Surface rather iridescent. Fully winged.

Lower surface. Prosternum very short, not surpassing procoxae, rounded off, posteriorly depressed, ventrally bordered. Proepisternum almost impunctate, with dense microreticulation and with some longitudinal striae. Mesepisternum rather densely, though somewhat superficially punctate. Metepisternum elongate, c. 2.5 × as long as wide at anterior border. Epipleura anteriorly moderately wide, posteriorly very narrow, moderately rugose. Abdomen impunctate, though laterally with some fine wrinkles. Microreticulation very distinct, isodiametric. ♀ sternum VII quadrisetose, apex evenly rounded.

Legs. Rather thin and elongate. 5th tarsomere asetose beneath. 4th tarsomere medially slightly excised. Vestiture of ♂ anterior tarsus unknown.

♂ genitalia. Unknown.

♀ genitalia. Stylomere 2 moderately elongate, fairly curved, with obtuse apex, with 3 ventral ensiform setae, a dorsal ensiform seta and one nematiform seta in a deep furrow rather close to apex. Apex of stylomere 1 ventrally with 6-7 setae near base of stylomere 2. Lateral plate with 7-8 setae at or near margin.

Variation. Some variation noted in relative shape of pronotum.

Distribution (Fig. 30). Eastern central Irian Jaya. Known only from type locality.

Habits. Collected in rain forest in median altitude.

Relationships. This species is most closely related to *C. laticolle* (Baehr) and *C. violaceum*, spec. nov., and *C. robustum*, spec. nov., respectively, and takes an intermediate position between both groups of species.

Etymology. The name is a patronym in honour of the collector of all species mentioned in this paper.

Collagonum robustum, spec. nov.

Figs 24, 28-30

Types. Holotype: ♂, Irian Jaya, Jayawijaya-Pr., Langda, 2100-2300 m, 27.-28.8.1992, leg. A. Riedel (ZSM). - Paratypes: 1♂, 1♀, same data (CBM).

Diagnosis. Elongate, violaceous species with wide, laterally markedly convex, distorted pronotum. Distinguished from related species by presence of wings and absence of both supraorbital setae and both pronotal setae.

Measurements. Length: 11.9-12.4 mm; width: 4.45-4.75 mm. Ratios. Width/length of pronotum: 1.54-1.58; width base/apex of pronotum: 1.44-1.51; width pronotum/head: 1.83-1.94; width elytra/pronotum: 1.09-1.14; length/width of elytra: 1.60-1.63.

Wing-and-seta formula: +w — -- + + +.

Colour. Black with slight violet-blue iridescence on the elytra. Lateral borders of pronotum reddish translucent, labrum with violet parts, antenna, and tarsi dark piceous. 1st-3rd antennomeres more or less distinctly infusate. Lower surface black.

Head. Narrow compared with prothorax. Neck rather narrow, elongate behind eyes. Eyes rather large, strongly, though not abruptly protruding, orbits almost absent. Clypeal suture distinct. Labrum moderately elongate, apex straight. Mandibles moderately elongate, straight. Antenna moderately elongate, surpassing base of pronotum by about one segment, median antennomeres c. 2.5 × as long as wide. Both palpi elongate, basal maxillary palpomere thickened. Furrow above antennal base and inside of eyes deep, conspicuous. Both supraocular setae absent. Frons rather evenly convex, impunctate, in middle with a very slight, triangular impression, laterally with a very shallow groove. Microreticulation distinct, isodiametric. Surface moderately glossy.

Prothorax. Wide, laterally broadly deplanate, evenly curved, much more narrowed to apex than to base. Widest diameter about in middle. Anterior angles remarkably projecting, at apex rounded off. Apex deeply excised, excision almost straight. Lateral margin convex to basal angles which bear a very small denticle. Base laterally straight, in middle feebly produced. Disk fairly convex, lateral parts broadly deplanate, slightly upturned. In anterior fourth with a shallow, slightly v-shaped depression, median line distinct, attaining neither apex nor base, base with a shallow transverse depression. Basal grooves deep, large, about circular. Apex bordered, lateral margins not bordered, base bordered in middle. Both marginal setae absent. Lateral channel and basal grooves coarsely and irregularly punctate-vermiculate, though punctures superficial. Disk impunctate, almost smooth. Microreticulation near apex and base about isodiametric, in middle rather superficial, consisting of very fine transverse lines. Surface on disk glossy, rather iridescent.

Elytra. Elongate, moderately wide, almost parallel, dorsal surface convex, lateral borders almost straight in anterior $\frac{2}{5}$, behind shoulders even faintly concave, towards apex evenly rounded. Widest diameter well behind middle. Preapical sinuosity rather shallow. Shoulders wide, rounded. Apex with a short, rounded projection opposite 3rd interval. Sutural angle without denticle. Striae deep, impunctate, intervals convex. Discal setae short, inconspicuous, anterior seta near 3rd stria, median and posterior setae near 2nd stria. 20 marginal setae and 3 apical setae present, two of the latter situated on apical border, one near 7th stria. Intervals impunctate. Microreticulation rather distinct, consisting of fine, dense, transverse lines. Surface slightly iridescent. Fully winged.

Lower surface. Prosternum very short, not surpassing procoxae, rounded off, posteriorly depressed, ventrally bordered. Proepisternum almost impunctate, with dense microreticulation. Mesepisternum rather densely, though superficially punctate. Metepisternum elongate, c. 2.5 × as long as wide at anterior border. Epipleura anteriorly moderately wide, posteriorly very narrow, moderately rugose. Abdomen impunctate, though laterally with some fine wrinkles. Microreticulation distinct, isodiametric. ♂ sternum VII bisetose, ♀ sternum VII quadrisetose, apex evenly rounded in both sexes.

Legs. Rather thin and elongate. 5th tarsomere asetose beneath. 4th tarsomere medially slightly excised. 1st-3rd tarsomeres of ♂ anterior tarsus biserially squamose.

♂ genitalia. Genital ring rather narrow, symmetric, apex narrow, fairly short. Aedeagus slightly curved, apical part extended to an elongate, strongly sclerotized rod that is downcurved in a weak though distinct angle. Apex obtusely angulate with a somewhat lancet-shaped tip but without lateral hooks. Internal sac without sclerotized plates or teeth. Both parameres rather elongate.

♀ genitalia. Stylomere 2 moderately elongate, fairly curved, with obtuse apex, with 2 ventral ensiform setae, a dorsal ensiform seta and one nematiform seta in a deep furrow rather close to apex. Apex of stylomere 1 ventrally with 6-7 setae near base of stylomere 2. Lateral plate with c. 6 setae at or near margin.

Variation. There is some variation in shape, because the holotype has slightly wider pronotum and wider and shorter elytra.

Distribution (Fig. 30). Eastern central Irian Jaya. Known only from type locality.

Habits. Collected in rain forest in median altitude.

Etymology. The name refers to the robust build of prothorax and elytra.

Collagonum convexum, spec. nov.

Figs 25, 27, 30

Types. Holotype: ♀, IRIAN JAYA, Jayawijaya-Pr., N. Bime 2000-2070 m, 21.IX.1993, leg. A. Riedel (ZSM-CBM).

Diagnosis. Moderately elongate, black species with wide, laterally markedly convex, distorted pronotum. Distinguished from related species by absence of wings, comparatively short and markedly convex elytra, presence of both supraorbital setae, and absence of anterior pronotal seta.

Description

Measurements. Length: 11.5 mm; width: 4.35 mm. Ratios. Width/length of pronotum: 1.45; width base/apex of pronotum: 1.38; width pronotum/head: 1.90; width elytra/pronotum: 1.18; length/width of elytra: 1.5.

Wing-and-seta formula: -w ++ -+ +++.

Colour. Black, labrum, mouth parts, and tarsi reddish-piceous, antenna piceous. Lower surface black.

Head. Narrow compared with prothorax. Neck rather narrow, elongate behind eyes. Eyes moderately large, strongly, though not abruptly protruding, orbits short, obliquely convex. Clypeal suture distinct. Labrum moderately elongate, apex straight. Mandibles moderately elongate, straight. Antenna moderately elongate, surpassing base of pronotum by about one segment, median antennomeres $<2.5 \times$ as long as wide. Both palpi elongate, basal maxillary palpomere thickened. Furrow above antennal base and inside of eyes rather deep, conspicuous. Both supraocular setae present, posterior setae situated shortly behind posterior margin of eye. Frons rather evenly convex, impunctate, in middle with a very slight, transverse impression. Microreticulation distinct, isodiametric. Surface moderately glossy.

Prothorax. Rather wide, laterally broadly deplanate, evenly curved, slightly more narrowed to apex than to base. Widest diameter about in middle. Anterior angles remarkably projecting, at apex rounded off. Apex deeply excised, excision narrow, almost straight. Lateral margin markedly convex, hence apex and base both rather narrow. Basal angles with a very small concavity, but without denticle. Base laterally straight, in middle feebly produced. Disk fairly convex, lateral parts broadly deplanate, slightly upturned. In anterior fourth with a shallow, slightly v-shaped depression, median line distinct, almost attaining apex, but not base, base with a shallow transverse depression. Basal grooves deep, large, about circular. Apex bordered, lateral margins not bordered, base bordered in middle. Anterior marginal seta absent, posterior seta situated right on basal angle. Lateral channel and basal grooves irregularly and rather superficially punctate-vermiculate. Disk impunctate, almost smooth. Microreticulation near apex and base about isodiametric, in middle rather superficial, consisting of fine transverse lines and meshes. Surface on disk moderately glossy, but not iridescent.

Elytra. Rather short and fairly wide, posteriorly distinctly widened, dorsal surface markedly convex, lateral borders slightly oblique in anterior half, towards apex evenly rounded. Widest diameter well behind middle. Preapical sinuosity rather shallow. Shoulders wide, evenly rounded. Apex with a short, rounded projection opposite 3rd interval. Sutural angle with an obtuse denticle. Striae deep, impunctate, intervals convex. Discal setae short, inconspicuous, anterior seta near 3rd stria, median and posterior setae near 2nd stria. 20 marginal setae and 2 apical setae present, one of the latter situated on apical border, the other near 7th stria. Intervals impunctate. Microreticulation rather distinct, consisting of fine, dense, transverse lines and meshes. Surface moderately glossy, not iridescent. Wingless.

Lower surface. Prosternum very short, not surpassing procoxae, rounded off, posteriorly depressed, ventrally bordered. Proepisternum impunctate, with dense microreticulation. Mesepisternum rather sparsely, superficially punctate. Metepisternum moderately elongate, $<2 \times$ as long as wide at anterior border. Epipleura anteriorly rather wide, posteriorly moderately narrow, rather rugose. Abdomen impunctate, though laterally with some fine wrinkles. Microreticulation distinct, isodiametric. ♀ sternum VII quadrisetose, apex evenly rounded.

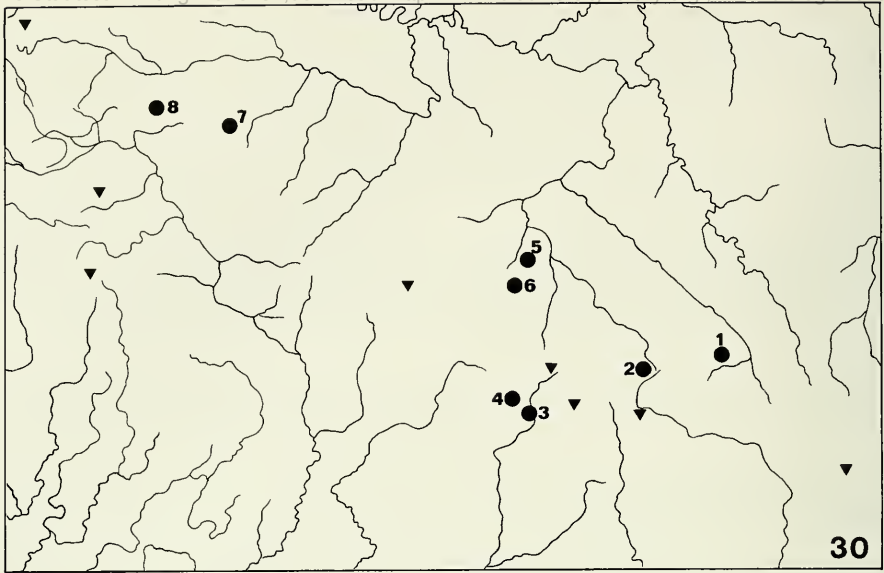


Fig. 30. Localities of recently collected *Fortagonum* and *Collagonum* material in central and eastern central Irian Jaya, including the species mentioned in Baehr (1992). Eastern (right) margin is the PNG/IJ border, western (left) margin lies slightly west of Gn. Trikora (Wilhelmina Top), upper (northern) margin is crossed by the Idenburg River, lower (southern) margin meets at the right border about the former Papua/New Guinea border. Triangles denote the highest mountains. For position of cut within New Guinea see fig. 31. Localities: 1. Borne area (*F. unipunctatum*, *C. laticolle macrops*); 2. Bime area (*F. spinosum*, *F. denticulatum*, *C. laticolle laticolle*, *C. convexum*); 3. Langda area (*F. latum*, *C. robustum*); 4. Bommela area (*F. bisetosiceps*, *C. riedeli*); 5. Diuremna area (*F. acuticolle*, *C. laticolle laticolle*); 6. Nalca area (*F. denticulatum*, *C. laticolle laticolle*); 7. Ilugwa area (*F. bufo*, *C. laticolle laticolle*); 8. Baliem area, pass Valley (*F. curtum*, *C. ophthalmicum*).

Legs. Rather thin and elongate. 5th tarsomere asetose beneath. 4th tarsomere medially slightly excised. Vestiture of ♂ anterior tarsus unknown.

♂ genitalia. Unknown.

♀ genitalia. Stylocere 2 moderately elongate, slightly curved, with obtuse apex, with 2 ventral ensiform setae, a dorsal ensiform seta and one nematiform seta in a deep furrow moderately close to apex. Apex of stylocere 1 ventrally with c. 6 setae near base of stylocere 2. Lateral plate with c. 15 setae at or near margin.

Variation. Unknown.

Distribution (Fig. 30). Eastern central Irian Jaya. Known only from type locality.

Habits. Collected in rain forest in median altitude.

Relationships. This is a very isolated species and altogether perhaps the most plesiomorphic species within the genus.

Etymology. The name refers to the short, convex shape of the elytra.

Discussion

The present descriptions of several new species and subspecies of the previous genus *Fortagonum* Darlington from both political divisions of New Guinea demonstrate once more the inadequate knowledge of the carabid fauna of the mountains of New Guinea. This extremely montane island is apparently inhabited by large numbers of locally distributed, generally closely related, to some extent wingless species that mainly populate the montane forests in median altitude throughout the whole island. This statement is not only true for the highly evolved genera *Fortagonum* and *Collagonum*,



Fig. 31. Distributions. *Fortagonum depressum*, spec. nov.: ●; *Collagonum violaceum*, spec. nov.: ■. The rectangle denotes the outline of the area enlarged in fig. 30.

but also for related agonine genera, some of which are perhaps even more diverse in terms of species, but the numerous species are likewise very locally distributed. It is also true for other, non-agonine genera, e.g. the lebiine genus *Demetriida* (Darlington 1968, 1971) or the pentagonicine genus *Scopodes* (Baehr 1994).

The agonine fauna of New Guinea is very rich and diverse, as stated by Darlington (1971), and due to better exploration it appears to be even considerably richer than Darlington imagined. Although several highly peculiar genera live in New Guinea, the generic limits are rather weak and become even weaker, as the fauna is being better studied. In the future, when the fauna is more adequately recorded, revisors will have to decide, in which way they will accomplish the large number and high diversity of the agonine fauna. Certainly the present generic concept of the New Guinean agonines is not really satisfying, because it includes too many genera of convenience the true generic limits and relationships of which are not yet known. A future revisor therefore must decide for either a very wide generic concept, in which, for example, the genera *Altagonum* Darlington, *Iridagonum* Darlington, *Montagonum* Darlington, *Nebriagonum* Darlington, and *Fortagonum* Darlington should be included in a single genus, and a more limited concept in which even more genera should be distinguished than at present. I do not know, however, which concept will be preferable. For the present I think it the best to keep most of the present genera without any change or subdivision in subgenera, even when this would seem advisable.

Concerning the genus *Fortagonum* such subdivision is made in the case of the species with a wide, distorted pronotum that also differ clearly from the remaining species in some other characters: e.g. the deep cleft inside of the eyes that divides the eyes from the frons; the elongate, parallel elytra with rounded shoulders; the peculiar aedeagus.

Within the genera *Fortagonum* and *Collagonum* several trends exist that are to a large part reductions: e.g. reduction of wings that is accompanied by shortening of the hind body; reduction of the fixed setae of head, pronotum, and elytra that may eventually lead to the total loss of all supraorbital, pronotal and discal setae; reduction of the microreticulation that leads to a glossy, rather iridescent surface. Other trends in both genera or the one or the other genus only are: lengthening of the mandibles that is commonly connected with a rather small and narrow head; enlargement of eyes that may eventually lead to markedly protruding eyes; reduction of eyes to such extent that they eventually barely project over the lateral margins of the head; development of spinose elytral apex.

Distribution of most of these trends, however, within the genus *Fortagonum* is remarkably heterobathmic. For example, reduction of wings is not always connected with reduction of fixed setae, but both states have been certainly evolved several times within the genus. Perhaps the predisposition for these reductions is generally present, but whether and to what extent they will be realized in the single species is different.

Unfortunately the evolutionary significance of most trends is obscure, because very little is known about the habits and life histories of the species. The only knowledge we have about the biology of *Fortagonum* and *Collagonum* species are the poor collecting records of the recently captured species. All

have been collected under logs or in the leaf litter of montane rain forests in median altitude. Virtually nothing, however, is known about the time of daily activity, feeding habits, diet, reproduction etc. And we do not even possess the slightest idea about the population density.

Certainly one would assume that a small head and long, porrect mandibles, or else a small head together with a markedly fusiform prothorax would be adaptations to the habits of eating snails in view of the cychriform shape of head and prothorax. Because virtually nothing is known about diet and feeding habits, however, the significance of this body shape is at present absolutely unknown. What significance the reduction of the fixed setae, or the laterally extremely protruding eyes, or the spinose elytra, or the wide, distorted pronotum have, is likewise completely obscure. With regard to the characteristic shape and structure of many species, however, investigation of the habits and life histories should be a very rewarding task.

The high similarity in external and genitalic characters of many species of both mentioned genera is certainly due to close relationships of the respective species, and it is the consequence of rather recent evolution or differentiation of most species that may be caused by the recent orogenetic events in New Guinea. Recent uplift in terms of geological time of the central mountains and increased erosion caused a marked dismembering of the highlands and so reinforced separation of beetle populations and eventually evolution of new taxa. Examples for these events are seen in the *F. unipunctatum-spinosum*-lineage and in the differentiation of *C. laticolle* in two subspecies. Both pairs of taxa have their bound in the valley of the Borne River or the mountain ridge to the west of this rather small, but deeply cut river. The rather feebly taxonomic differentiation of both pairs of taxa points to a fairly recent speciation that may be occurred as late as in or even after the last glaciation period.

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Alphabetical checklist of the species of the genus *Fortagonum*

<i>acuticolle</i> , spec. nov.	20
<i>antecessor</i> Darlington, 1971	18
<i>bigemum</i> (Darlington, 1971)	17
<i>bisetosiceps</i> , spec. nov.	19
<i>bufo</i> Darlington, 1952	17
<i>curtum</i> Baehr, 1992	18
<i>cychriceps</i> Darlington, 1952	18
<i>denticulatum</i> , spec. nov.	26
<i>depressum</i> , spec. nov.	28
<i>forceps</i> Darlington, 1952	18
<i>formiceps</i> Darlington, 1971	18
<i>fortellum</i> Darlington, 1952	18
<i>latum</i> , spec. nov.	22
<i>okapa</i> Darlington, 1971	18
<i>oodinum</i> Darlington, 1971	18
<i>spinosum</i> , spec. nov.	25
<i>subconicollae</i> (Darlington, 1971)	17
<i>unipunctatum</i> , spec. nov.	23

Alphabetical checklist of the species of the genus *Collagonum*

<i>convexum</i> , spec. nov.	39
<i>distortum</i> (Darlington, 1971)	31
<i>hornabrooki</i> (Darlington, 1971)	31
<i>laticolle</i> (Baehr, 1992)	31
<i>laticolle laticolle</i> (Baehr, 1992)	31
<i>laticolle macrops</i> , subspec. nov.	32
<i>limum</i> (Darlington, 1952)	31
<i>ophthalmicum</i> (Baehr, 1992)	30
<i>riedeli</i> , spec. nov.	36
<i>robustum</i> , spec. nov.	37
<i>violaceum</i> , spec. nov.	33

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