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On the discovery of two new species of the genus *Agrypon* FÖRSTER (Hymenoptera, Ichneumonidae, Anomaloninae) from Georgia (Sakartvelo)

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A b s t r a c t : Two new species of the genus *Agrypon* from the Kintrishi National Park in Georgia are described for the first time: *Agrypon bilineatum* PÉNIGOT nov.sp., and *Agrypon laevifrontator* PÉNIGOT nov.sp. A description and pictures of these new species are given.

K e y w o r d s : *Agrypon*, new species, Georgia, Caucasus, Palearctic.

Introduction

In recent years, several surveys have been done in Georgia using Malaise trap collecting during whole seasons in different areas resulting in three publications (RIEDEL et al. 2018, RIEDEL & JAPOSHVILI 2021, RIEDEL et al. 2023) with 799 species new for the Ichneumonid fauna of Georgia, and 13 new species for science. In the last publication (RIEDEL et al. 2023), the subfamily Anomaloninae has been studied by the first author. However, eight specimens, consisting of two morpho-species, were not included because they could not be identified. In the present article, these two new species are described.

Material and methods

The material was collected using Malaise traps located at two different localities in the Kintrishi National Park. The traps were installed from 20.iv.2018 and the collecting lasted until 03.xi.2018, for higher altitudes trap collecting was terminated at 8.x.2018 due to cold weather conditions. During this time, Malaise traps were checked and emptied bi-weekly.

The Malaise trap n°7 (41.44137364°N, 41.58451668°E) was placed at the altitude of 404 m asl (Fig. 1) and the Malaise trap n°4 (41.4438.8824°N, 42.0502904°E) at 1264 m asl (Fig. 2).

The climate, until 500 m asl, where the upper border with Colchis forest is, the average annual temperature is 12 °C and precipitation about 2500 mm, while the average temperature between 1000-1800 m asl is 8.5-9 °C and precipitation about 3000 mm.

Specific botanical studies have not been conducted by the authors, however we provide general description of the habitats where the material was collected. Humid thermophilic Colchis broadleaf forest is present between 100-1200 m above sea level and has 2 sub-zones: mixed broadleaf forest belt and chestnut forest belt. Mixed broadleaf forest is found up to 500 m altitude, while the chestnut forest belt stretches from 500-1100 m altitude.

Mixed broadleaf forest is presented with 14-20 m high trees such as: *Fagus orientalis*, *Carpinus caucasica*, *Tilia begoniifolia*, *Castanea sativa* and others. Undergrowth is with 4-12 high bushes and trees, such as *Corylus avellana*, *Frangula alnus*, *Viburnum opulus*, *Sambucus nigra* and others. Finally with 2-3 m high bushes: *Rhododendron ponticum*, *Laurocerasus officinalis*, *Ilex colchica*, *Buxus colchica*, *Rhododendron luteum*, *Vaccinium Arctostaphylos*, more rarely *Euonymus leiophlea*, *Hedera colchica*, *Clematis vitalba*, *Humulus lupulus*, *Periploca graeca*, *Lonicera caprifolium*. Above 1000 m is typical beech belt, characteristic for this zone are *Fagus orientalis*, *Castanea sativa*, *Carpinus caucasica*, *Tilia caucasica*, *Vaccinium arctostaphylos*, *Rhododendron luteum*; *R. ponticum*, *R. ungerii*, *R. caucasicum* and other species (ANONYMOUS, 2021).



Fig. 1: Location of the Malaise trap n°7 and its environment.



Fig. 2: Location of the Malaise trap n°4 and its environment.

For the species descriptions below, morphological terms follow GAULD (1991) and BROAD et al. (2018).

Used abbreviations

CI.....cubital index of fore wing ($\frac{\text{length of Cu between } 1m-cu \text{ and } 2Cu-a}{\text{length of } 2Cu-a}$)
 Fwl.....fore wing length
 IOD.....inter ocellar distance (distance between lateral ocelli).
 OBI.....ovipositor hind basitarsus index ($\frac{\text{length of ovipositor sheath}}{\text{length of hind basitarsus}}$)
 OODocular-ocellar distance (distance between eye and lateral ocellus)
 NI.....nervellar index of hind wing ($\frac{\text{length of Cu1 between } M+Cu \text{ and } cu-a}{\text{length of } cu-a}$)
 Tmetasomal tergite (T1 meaning the 1st metasomal tergite)

The pictures of the specimens were taken by the first author with a Nikon D3300 either with a Nikon AF-P DX NIKKOR 18-55 mm objective mounted with a reverse ring, or a Nikon Plan 4x/0.13 phase microscope objective lens, and processed with Zerene Stacker.

Results

Agrypon bilineatum PÉNIGOT nov.sp. (Figs 3A, B, C, D, E)

Holotype: 1♀ "SW GEORGIA Kintrishi NP. 404 m asl 41.44137364°N 41.58451668°E MT7. 23.IV.-5.V.2018 leg. G. Japoshvili" // "*Agrypon* ♀ det. Riedel 2022" // "Holotypus *Agrypon bilineatum* PÉNIGOT 2024".

Paratypes: 3♂♂ "SW GEORGIA Kintrishi NP. 404m asl 41.44137364°N 41.58451668°E MT7. 23.IV.-5.V.2018 leg. G. Japoshvili" // "Paratypus *Agrypon bilineatum* PÉNIGOT 2024"; and 1♂ "SW GEORGIA Kintrishi NP. 404 m asl 41.44137364°N 41.58451668°E MT7. 5-20.V.2018 leg. G. Japoshvili" // "Paratypus *Agrypon bilineatum* PÉNIGOT 2024".

Description of the holotype:

Head. Distance between the base of the antennae and the clypeus $1.13 \times$ the minimal width of face. Eyes weakly converging ventrally, maximal width of face $1.28 \times$ its minimal width. Face centrally finely reticulate-punctate and weakly shining, the lateral margins smooth and shining. Clypeus about $1.75 \times$ wider than high, smooth, and shining, with few superficial punctures. Apical margin of clypeus raised with a strong median tooth. Malar space $0.3 \times$ the width of the mandibular base. Lower tooth of mandibles $0.7 \times$ as long as the upper. Frons shining, in great part reticulate, with a distinct median vertical carina. Torulus prolonged dorsally, and slightly but distinctly elevated on the ventral third of the frons. Temples long, subparallel, not wider than the eyes in dorsal view, $0.88 \times$ the width of the eye in lateral view. Temples very finely shagreened, shining, with sparse thin punctures, the distance between two points about $2 \times$ longer than the diameter of the punctures. Occipital carina complete, reaching the hypostomal carina slightly after the base of the mandibles. These two carinae distinctly lamellar close to the mandibles, higher than $0.5 \times$ the width of the mandibular base. OOD $1.62 \times$ larger than IOD. Antennae with 52 flagellomeres. 1st flagellomere $9.2 \times$ longer than wide, and $2.45 \times$ longer than the 2nd. 10th flagellomere $2.4 \times$, and subapical flagellomeres $2.0 \times$ longer than wide.

Mesosoma. Antero-ventral corner of pronotum rounded. Pronotum smooth and shining,

the ventral half longitudinally striate, the upper half reticulate-punctate. Dorsal margin of pronotum slightly but distinctly impressed. Epomia distinct, forming a rounded 90° angle at its mid-length, and reaching the anterior margin of the mesoscutum. Anterior edge of mesoscutum weakly and regularly rounded in lateral view. Notauli weakly impressed, but distinct in the anterior half of the mesoscutum. Mesoscutum $1.32 \times$ longer than wide in dorsal view, smooth and shining with moderately thin and sparse punctures, the distance between two points about as long as the diameter of the punctures. Median lobe of mesoscutum reticulate on the posterior 0.25. Scuto-scutellar groove wide, centrally $0.32 \times$ as wide as the diameter of the lateral ocellus. Scutellum almost flat, transversally reticulate, with complete lateral carinae. Mesopleura moderately shining, finely shagreened, with thin and dense punctures in the lower third, with few reticulations medially, and with coarse reticulations in the upper third. Speculum smooth and shining, not shagreened. Prepectal carina strongly lamellate and bilobed behind the fore coxae. Prepectal carina forming a conspicuous tooth-like angle in front of the lower corner of the pronotum. Lateral part of prepectal carina almost reaching the mid-height of the mesopleura, where it fuses with reticulations just before the anterior margin of the mesopleura. Mesosternal suture flat, with thin transverse carinulae on its entire length. Postpectal carina narrowly interrupted in front of the mid coxae. Metasternal tooth indistinct. Propodeum coarsely reticulate, $0.85 \times$ as long as wide in dorsal view. Apex of propodeum reaching the apical 0.5 of the hind coxae.

Wings. Fwl = 8.8 mm. CI = 0.3. Discoidella mostly erased, the nervellus weakly broken at the theoretical junction with the discoidella, NI = 1.5. Hind wing with 7 distal hamuli.

Legs. Ventral face of the fore coxae with a distinct carina extending on the internal, anterior, and posterior edges. Hind coxae $2.0 \times$ longer than high in lateral view. Hind trochanters $1.55 \times$ longer than the hind trochantelli in ventral view. Hind femora $8.6 \times$ longer than high in lateral view, and $0.64 \times$ as long as hind tibiae. Hind basitarsi $0.52 \times$ as long as the hind tibiae, $2.65 \times$ longer than the 2nd hind tarsomeres, and $13.7 \times$ longer than wide. 2nd hind tarsomeres $6.1 \times$ longer than wide. Hind tarsal claws short, only weakly longer than the pulvillus, weakly curved at apex, with thin pectination on basal 0.7.

Metasoma. Spiracle of 1st metasomal segment situated on the apical 0.74. Postpetiole $1.35 \times$ longer than wide in dorsal view. T2 $1.24 \times$ longer than T1, and $8.5 \times$ longer than high in lateral view. T3 $0.54 \times$ as long as T2, and $1.6 \times$ longer than high in lateral view. Estimated OBI (sheath absent) = 0.75, the whole ovipositor $1.05 \times$ longer than hind basitarsi. Ovipositor almost straight, only indistinctly downcurved.

Colour. Head, mesosoma and coxae with short whitish pubescence. Head black. Face yellow with two reddish vertical bands extending from the antennae to the clypeal foveae, this bands partly fused medially. Clypeus, mandibles (except for the blackish teeth), and malar space, yellow. Palpi ivory. Outer orbits with a short and thin yellow line. Upper outer orbit with a quite broad red spot. Scapes and pedicelles black. Mesosoma black. Tegulae yellow. Wings hyalin with brownish veins, pterostigma yellowish. Fore and mid legs yellowish-red, fore coxae mostly black, mid coxae entirely black. Hind coxae, trochanters, and trochantelli black. Hind femora red, darkened on the basal 0.2. Hind tibiae red, with the apex and a dorsal subbasal mark darkened. Hind tarsi yellow. Metasoma red. T2 dorsally, T5 apically, and T6-8 black. Ovipositor greyish-black on the basal half, yellowish in the apical half.

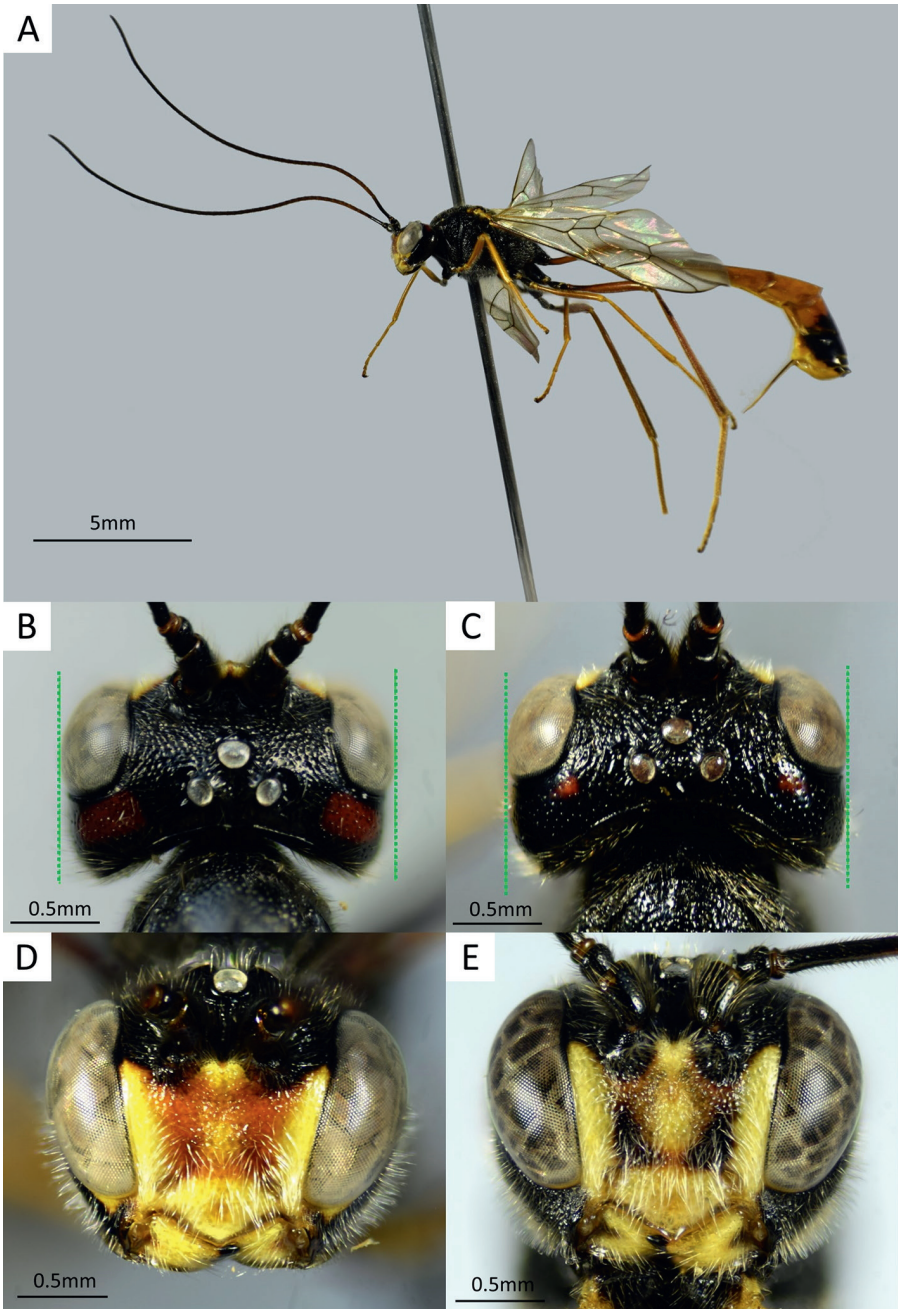


Fig. 3: *Agrypon bilineatum* PÉNIGOT nov.sp. (A) ♀ holotype, habitus in lateral view; (B) ♀ holotype, head in dorsal view; (C) ♂ paratype, head in dorsal view; (D) ♀ holotype, head in frontal view; (E) ♂ paratype, head in frontal view.

Description of the male: Very similar to the female, but differing by the following characters. Temples slightly longer and a little wider in dorsal view, $0.95\text{--}1.10 \times$ longer than the eye in lateral view. Hind femora slightly stouter, $7.6\text{--}8.0 \times$ longer than high in lateral view. Vertical bands on the face black, or reddish-black. Fore and mid coxae and trochanters more yellow-marked. Parameres black.

Intraspecific variability. Fwl = $8.4\text{--}8.8$ mm. Antennae with 49–53 flagellomeres. Temples $0.85\text{--}1.10 \times$ longer than the eye in lateral view. Postpetiole $1.25\text{--}1.40 \times$ longer than wide in dorsal view.

E t y m o l o g y : The name refers to the two broad vertical reddish to black bands on the yellow face.

B i o l o g y : Unknown.

D i a g n o s i s : This species is closely related to *Agrypon polyxena* (SZÉPLIGETI, 1899) because it shares the following characters: mesoscutum smooth and shining between the rather sparse punctures; carinated fore coxae; 1st flagellomere more than $2 \times$ longer than the 2nd; notauli weakly impressed; conspicuous tooth-like angle of the prepectal carina in front of the lower corner of the pronotum; upper outer orbits with a red spot; weak metasternal tooth; stout propodeum and postpetiole; and quite long temples. It differs from *A. polyxena* by the typical two vertical reddish to black bands on the face (Figs 3D, E); and the less widened and slightly shorter temples (Figs 3B, C).

***Agrypon laevifrontator* PÉNIGOT nov.sp.** (Figs 4A, B, C)

Holotype: 1♀ "SW GEORGIA Kintrishi NP. 1264 m asl $41.44388824^{\circ}\text{N}$ $41.0502904^{\circ}\text{E}$ MT4. 5-20.V.2018 leg. G. Japoshvili" // "Anomaloniinae ♀ det. Riedel 2021" // "Holotypus *Agrypon laevifrontator* PÉNIGOT 2024".

Paratypes: 1♀ "SW GEORGIA Kintrishi NP. 1634 m asl $41.44535308^{\circ}\text{N}$ $41.05384144^{\circ}\text{E}$ MT4. 19.V.-1.VI.2018 leg. G. Japoshvili" // "Paratypus *Agrypon laevifrontator* PÉNIGOT 2024"; and 1♀ "SW GEORGIA Kintrishi NP. 1634 m asl $41.44535308^{\circ}\text{N}$ $41.05384144^{\circ}\text{E}$ MT12. 5-20.V.2018 leg. G. Japoshvili" // "Paratypus *Agrypon laevifrontator* PÉNIGOT 2024".

Description of the Holotype:

Head. Distance between the base of the antennae and the apex of the clypeus $1.14 \times$ longer than the minimal width of the face. Eyes weakly converging ventrally, maximal width of face $1.38 \times$ longer than its minimal width. Face centrally finely punctate, superficially rugulose, and weakly shining, the lateral margins of the face smooth and shining. Clypeus $1.81 \times$ wider than high, smooth, shining, with some superficial punctures on its upper part. Apical margin of clypeus raised with a distinct median tooth. Malar space $0.3 \times$ as long as the mandibular base. Lower mandibular tooth $0.45 \times$ as long as the upper. Frons smooth, only superficially rugulose-punctate above the antennae, with a low but distinct vertical median carina. Lateral and upper parts of frons smooth with very thin, almost indistinct, punctures. Temples quite short and convexly narrowed behind the eyes, $0.58 \times$ as long as the width of the eye in lateral view. Temples smooth and shining, with very thin and sparse punctures posteriorly, the distance between two points about $4 \times$ longer than the diameter of the punctures. Occipital carina complete, joining the hypostomal carina slightly after the mandibular base. OOD $1.7 \times$, and IOD $1.2 \times$ longer than the maximal diameter of the lateral ocellus. Antennae with 38 flagellomeres. 1st flagellomere $5.25 \times$ longer than wide and $1.6 \times$ longer than the 2nd. 10th flagellomere $3.0 \times$, and subapical flagellomeres $2.3 \times$ longer than wide.

Mesosoma. Antero-ventral corner of the pronotum rounded, without tooth. Pronotum irregularly longitudinally striate ventrally, but with a large smooth and shining area dorsally. Dorsal margin of pronotum longitudinally impressed, this groove with transverse carinulae. Epomia distinct, joining the anterior margin of the mesoscutum. Anterior edge of mesoscutum depressed. Notauli quite weak but distinct and complete. Mesoscutum $1.1 \times$ longer than wide in dorsal view, smooth and shining, with moderately thin and sparse punctures, the distance between two points about as long as the diameter of the punctures. Posterior 0.25 of the median lobe of mesoscutum reticulate. Scutellum flat, reticulate, with distinct lateral carinae on the basal 0.8. Mesopleura shining, with thin punctures in the lower half, centrally with a smooth area, and with some irregular carinulae in the upper third. Speculum smooth and shining. Prepectal carina only slightly higher ventrally than laterally, and weakly bilobed behind the fore coxae. Lateral part of the prepectal carina extending beyond the mid-height of the mesopleura, fused with irregular reticulations just before the anterior margin of the mesopleura. Mesosternal suture smooth, without transverse carinulae. Postpectal carina interrupted in front of the mid coxae. Metasternal tooth small but present. Propodeum coarsely reticulate, as long as wide in dorsal view. Apex of propodeum reaching the apical 0.5 of the hind coxae.

Wings. Fwl = 5.2 mm. CI = 0.3. Discoidella absent, nervellus slightly curved. Hind wing with 6 distal hamuli.

Legs. Ventral face of the fore coxae with a distinct carina extending on the internal, anterior, and posterior edges. Hind coxa $2.7 \times$ longer than high in lateral view. Hind trochanter $1.45 \times$ longer than the trochantellus in ventral view. Hind femora $5.9 \times$ longer than high in lateral view, and $0.63 \times$ as long as the hind tibia. Hind basitarsus $0.50 \times$ as long as the hind tibia, $2.4 \times$ longer than the 2nd tarsomere, and $8.8 \times$ longer than wide. 2nd hind tarsomere $4.6 \times$ longer than wide. Hind tarsal claws hardly longer than the pulvillus, weakly curved, and with very short indistinct pectination basally.

Metasoma. Spiracle of 1st metasomal segment situated on the apical 0.73. Postpetiole $1.6 \times$ longer than wide in dorsal view. T2 $1.2 \times$ longer than T1, and $8.9 \times$ longer than high in lateral view. T3 $0.45 \times$ as long as T2, and $1.55 \times$ longer than high in lateral view. OBI = 0.95.

Colour. Head, mesosoma and coxae with short whitish pubescence. Head black. Face yellow. Clypeus, mandibles (except for the blackish teeth), malar space, and lower third of outer orbits, yellow. Vertex with a small (slightly larger than the lateral ocellus) yellow spot. Palpi pale yellow. Antennae dark brown dorsally, pale brown ventrally, except for the mostly black 1st flagellomere. Scapus black, yellow beneath. Pedicellus entirely black. Mesosoma black, the upper hind corner of the pronotum and the subtegular ridge with a small yellowish spot. Tegula yellow. Wings hyalin with brown veins. Pterostigma greyish-brown. Fore and mid legs entirely pale yellow, except for the brownish 5th tarsomere. Hind coxa, trochanter and trochantellus, black. Hind femora brownish, reddish basally and medio-ventrally, with a subbasal dark ring. Hind tibia reddish medially, reddish-brown basally and subapically, black on the apical 0.2. Hind tarsus mostly yellow, basitarsus with the 0.75 basal reddish-brown, 5th tarsomere brown. Petiole brown, with the postpetiole red. T2 mostly brownish-black, with only the ventral margin red. T3-4 brownish dorsally, red on the ventral half. T5 black with the antero-ventral corner broadly red. T6-8 black, with the ventral margin yellow. Sheath and ovipositor reddish-yellow.

Male unknown.

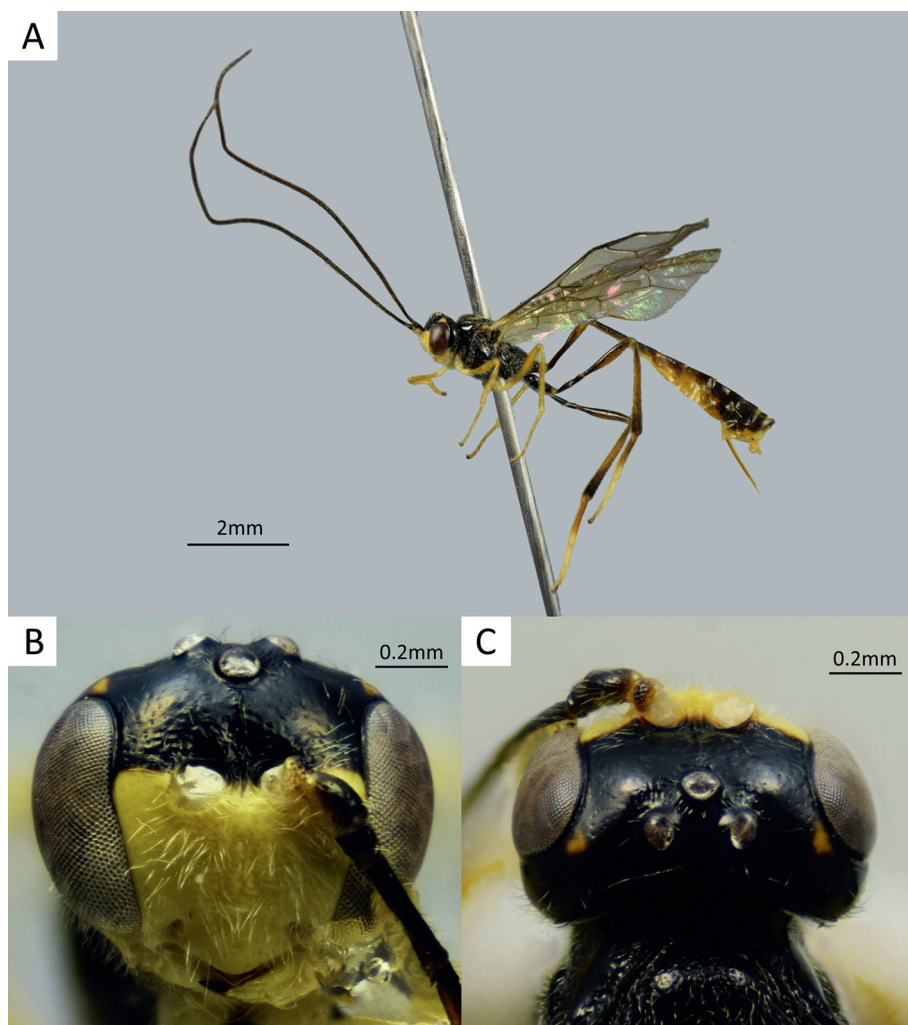


Fig. 4: *Agrypon laevifrontator* PÉNIGOT nov.sp. (A) ♀ holotype, habitus in lateral view; (B) ♀ paratype, head in frontal view; (C) ♀ paratype, head in dorsal view.

Intraspecific variability. Fwl = 4.7-5.2 mm. Antennae with 38-40 Flagellomeres. Temples $0.57-0.63 \times$ as wide as the eye in lateral view. OOD $1.7-1.9 \times$ the maximal diameter of the lateral ocellus. Hind femora $5.9-6.2 \times$ longer than high in lateral view. OBI 0.95-1.0. Frons above antennae varying from almost entirely smooth, to superficially rugulo-punctate.

E t y m o l o g y : The name refers to the very weakly sculptured frons compared to the other western Palearctic *Agrypon* species of the *A. varitarsum* group.

B i o l o g y : Unknown.

D i a g n o s i s : This species is closely related to *Agrypon varitarsum* (WESMAEL, 1849) and *Agrypon* sp. A in PÉNIGOT, 2021 – the later should belong to *A. cognatum* FÖRSTER,

1860 (PÉNIGOT in prep.) – because it shares the following characters: mesoscutum smooth and shining between the rather sparse punctures, and with distinct notauli; carinated fore coxae; 1st flagellomere less than $2 \times$ longer than the 2nd; upper lateral part of pronotum and the upper half of mesopleura with a smooth unpunctate shining area; long and thin antennae, with the 2nd flagellomere about $4.0\text{--}4.5 \times$ longer than wide. It differs from *Agrypon varitarsum* and *Agrypon* sp. A by the typical weakly sculptured frons (Figs 4B, C), smaller ocelli, and black hind coxae.

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Zusammenfassung

Zwei neue Arten aus der Gattung *Agrypon* werden aus dem Kintrishi Nationalpark in Georgien neu beschrieben und abgebildet, es sind dies *Agrypon bilineatum* PÉNIGOT nov.sp., und *Agrypon laevifrontator* PÉNIGOT nov.sp.

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