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***Phaenocarpa kolaensis* sp. n. from the Kola
Peninsula, NW. Russia (Hymenoptera:
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Veli Vikberg

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Phaenocarpa kolaensis sp. n. from the Kola Peninsula, NW. Russia (Hymenoptera: Ichneumonoidea: Braconidae: Alysiinae)

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Abstract. Females and males of a new species of *Phaenocarpa* were reared from artificial bird nests, which were made of unwashed hen feathers. Nests were exposed during the growth season of 2001 and located south of the nickel-copper smelter at Monchegorsk, northwestern Russia. *Phaenocarpa* (*Phaenocarpa*) *kolaensis* sp. n. is closely related to *P. (P.) ruficeps* (Nees, 1812) and *P. (P.) kozyrevskii* Belokobylskij, 1998. Its host flies are most probably saprophilous species of Anthomyiidae, which were reared together with species of Piophilidae from the same artificial bird nests.

Phaenocarpa kolaensis sp. n. Kuolan niemimaalta Luoteis-Venäjältä

Lyhennelmä. *Phaenocarpa kolaensis*, tieteelle uusi vainopistiäislaji, kasvatettiin keinotekoisista linnunpesistä, joiden rakennusmateriaalina käytettiin likaisia kanan höyheniä ja sulkia. Pesät oli sijoitettu kasvukaudeksi 2001 Luoteis-Venäjälle Kuolan niemimaalle Montšegorskin nikkeli-kuparisulaton eteläpuolelle. Pesät houkuttelivat saprofiilejä Anthomyiidae- ja Piophilidae-heimojen kärpäsiä. Ilmeisesti Anthomyiidae-heimon kärpästoukat ovat uuden vainopistiäisen isäntiä, koska läheinen laajalle levinnyt laji, *Phaenocarpa ruficeps* (Nees, 1812), on kasvatettu saman kärpäsheimon toukista. Toisen, Kamšatkasta tunnetun, läheisen lajin, *P. kozyrevskii* Belokobylskij, 1998, isäntiä ei tunneta.

Introduction

Artificial bird nests were made from unwashed hen feathers and were exposed during the growth season of 2001 at 14 study sites with three nests per site by Dr. Mikhail V. Kozlov and his co-workers. The study sites were located in lowland forest zone within 65 km of the the Severonikel nickel-copper smelter at Monchegorsk (67° 55' N, 32° 48' E), the Kola Peninsula in northwestern Russia. The feather traps were exposed in the field from 17 June to 5 August 2001, then placed in individual plastic containers and kept outdoors in Monchegorsk until next summer. Containers were surveyed on 12 July 2002 and all insects and their remnants were collected and preserved in cotton layers. The material consisted of 562 flies of which 232 were Piophilidae and 330 Anthomyiidae. Only a small part of the flies

could be identified to the species level, because the specimens were badly damaged. Of Anthomyiidae, 20 specimens were identified as *Lasiomma strigilatum* (Zetterstedt) and 6 specimens as *L. picipes* (Meigen). Two parasitic species of Hymenoptera were also present. They were given to the author for identification. Among them there were 17 specimens belonging to a species of *Trybliographa* (Cynipoidea: Figitidae: Eucoilinae). Of those, four eucoiline specimens were sent to Dr. Mattias Forshage for further study. They were later described to represent a new species *T. ptilicola* Forshage and Nordlander in Forshage (2009). However, due to a disclaimer in the work the new name is yet not available. The other parasitic hymenopteran species in the material, *Phaenocarpa* sp. (Ichneumonoidea: Braconidae: Alysiinae), was



Fig. 1. *Phaenocarpa kolaensis* sp. n., holotype female in lateral view. Photograph taken by Pekka Malinen.

Kuva 1. *Phaenocarpa kolaensis* sp. n., naaras sivulta (holotyypipi).

represented by 71 specimens. Specimens of this species were recorded from 10 study sites: 4 specimens north of Monchegorsk and the rest south of Monchegorsk. This braconid species is here described as a new species to science.

The specimens were studied, measurements made and drawings prepared as described in Koponen & Vikberg (2005). The terminology of the present description follows Sharkey & Wharton (1997) and Belokobylskij (1998). Precoxal sulcus is used instead of sternaulus according to Wharton (2006).

***Phaenocarpa (Phaenocarpa) kolaensis* sp. n.**

Female (Figs. 1-2). Head black. Lower temple often reddish brown. Mandible pale brown with dark brown teeth. Scape and pedicel partly brownish. Palpi brownish. Mesosoma black. Tegula dark brown, humeral plate brown. Legs pale, brown. Wings slightly opalescent, veins dark brown to brown, stigma brown. Metasoma black to brownish black. Length of body 1.6-2.6 mm. Length of fore wing 2.0-3.0 mm when measured from apex of humeral plate to apex of wing.



Fig. 2. *Phaenocarpa kolaensis* sp. n., paratype female in dorsal view. Photograph taken by Pekka Malinen.

Kuva 2. *Phaenocarpa kolaensis* sp. n., naaras päältä (paratyypipi).

Head large, its width (0.56-0.66 mm) is 1.4-1.5 times as wide as mesoscutum. In dorsal view head is 1.6 times as wide as long with temples anteriorly rounded and posteriorly narrowed, length of temple is 0.65 times as long as diameter of eye. Width of head at lower temples almost equal to width at outer margins of eyes. Face smooth, its width is 1.7 times its height medially. Mandible (Fig. 3) subparallel, not widened apically, its medial length is 1.5 times as long as its maximum width. Upper tooth of mandible broader than the sharp middle tooth, no incision between them; lower tooth smaller than both other teeth and with an incision between it and middle tooth. Antenna with 20-22 flagellomeres, 1.2-1.4 times as long as body, slightly shorter than forewing, that is 0.95 times as long as length of forewing. Flagellomere 1, when annellus excluded, 3.5 times as long as its maximum width, 0.74-0.87 times as long as flagellomere 2, which is 4.1 times as long as its width. Flagellomere 10 is 2.6 times as long as wide, preapical flagellomere is 2.1 times as long as wide; apical flagellomere slightly narrower than preapical flagellomere.

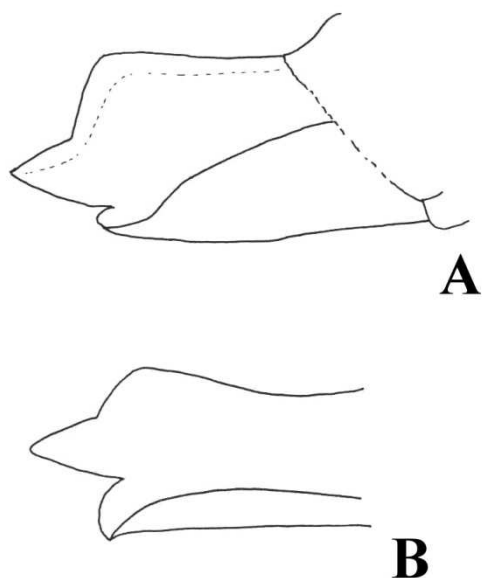


Fig. 3. *Phaenocarpa kolaensis* sp. n., holotype female. – A: left mandible showing tooth 1 from an outer aspect. – B: left mandible showing tooth 3 from an outer aspect.

Kuva 3. *Phaenocarpa kolaensis* sp. n., holotyypinaaras. – A: vasen leuka kulmasta, missä hammas 1 näkyy ulkoa leveimmillään. – B: vasen leuka nähtynä kulmasta, missä hammas 3 näkyy ulkoa leveimmillään.

Mesosoma is 1.4 times as long as high. Mesoscutum smooth, shiny, with setae only along notauli and lateral margins. Notauli either deep, complete, meeting at anterior end of mesoscutal pit or apically more or less reduced or absent. Mesoscutal pit short, deep, and present on posterior 0.3 of mesoscutum. Prescutellar fovea short, with longitudinal wrinkles, about 4-5 times as wide as its medial length. Median keel of metanotum posteriorly pointed. Precoxal sulcus strong, curved, crenulated. Anterior 0.3 of propodeum rather smooth, with a median keel, posteriorly wrinkled. Pterostigma is 3.6 times as long as wide, emitting vein r at 0.6 measured from base. Vein 3RSa is 0.5 times as long as vein 3RSb and 1.7 times as long as vein 2RS. 2nd submarginal cell long, 2.8 times as long as its maximum width. Vein m-cu interstitial or slightly antefurcal. Vein 1M of hind wing 1.2 times as long as M+CU. Hind femur slender, 6.1 times as long as wide when trochantellus excluded. Claws thin, curved, projecting slightly beyond pulvillus.

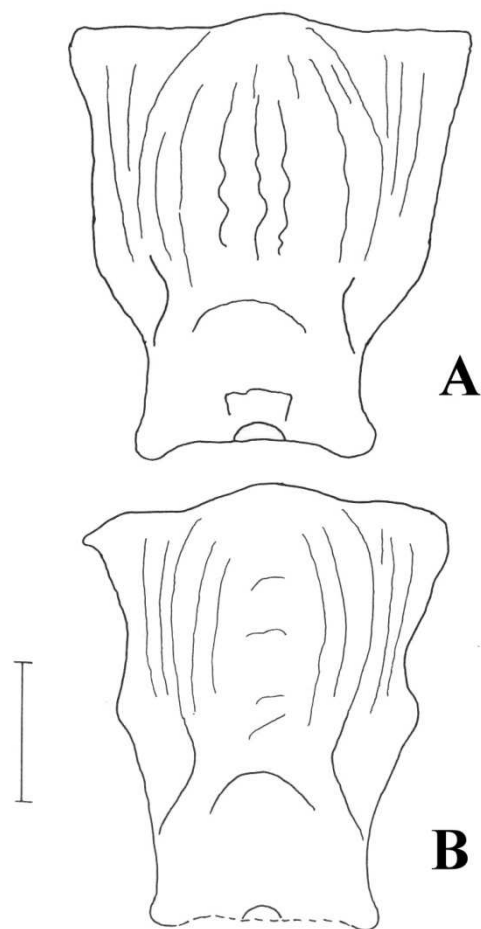


Fig. 4. *Phaenocarpa kolaensis* sp. n., metasomal tergum 1 in dorsal view. Length of scale line 0.1 mm. – A: holotype female, – B: paratype female from the type locality.

Kuva 4. *Phaenocarpa kolaensis* sp. n., takaruumiin 1. selkäkilpi ylhäältä nähtynä. Mittajanan pituus 0.1 mm. – A: holotyypinaaras, – B: paratyypinaaras tyyppilokaalista.

Tergum 1 of metasoma (Fig. 4) widening apically, 1.1-1.3 times as long as its width apically, longitudinally wrinkled. Setose part of ovipositor sheath covered with rather dense, semi-erect setae, apically with a spine that is 0.95-1.0 times as long as metasoma, 1.1-1.2 times as long as hind tibia and 0.38-0.39 times as long as forewing.

Measurements of the holotype (lengths in 0.01 mm units, unless given otherwise): width of head 61, scape 14, pedicel 6, flagellomere 1: 14, 2: 19, 3: 17, 4: 15, 5: 14, 10: 12, 20 (preapical): 10 and apical: 10. Mesosoma 88, width of mesoscutum 42, metasoma 105. Forewing 275, width 100. Setose part of ovipositor sheath 105.



Fig. 5. *Phaenocarpa kolaensis* sp. n., paratype male in lateral view. Photograph taken by Pekka Malinen.
Kuva 5. *Phaenocarpa kolaensis* sp. n., koiras sivulta (paratyypipi).

Male (Fig. 5). Rather similar to female. Body length 1.8-2.4 mm, head width 0.62-0.70 mm, fore wing length 2.3-3.0 mm. Antenna with 22-24 flagellomeres, distinctly longer than forewing, i.e. 1.3 times as long as forewing. Prescutellar fovea slightly longer and stigma more heavily sclerotized than in female.

Holotype female: Russia, Murmansk region, 18 km S of Monchegorsk, feather trap 1239-1, exposed 17 June-5 August, 2001, examined 12 July, 2002; leg. A. Vassiliev, V. Zverev & M. V. Kozlov. Paratypes: 12 females and 8 males with the same collecting data as the holotype as well as 24 females and 12 males from other feather traps 13.8 or 27 km south of Monchegorsk, exposed in 2001. The holotype and 1 female and 1 male paratype are deposited in the Finnish Museum of Natural History, University of Helsinki; the other paratypes are deposited in the National Museum of Natural History (Naturalis), Leiden and in coll. V. Vikberg, Turenki. Further specimens examined are 10 specimens that were damaged during the transport from Monchegorsk to Turku so badly that their sex could not be determined. These 10 specimens are excluded from the paratype series.

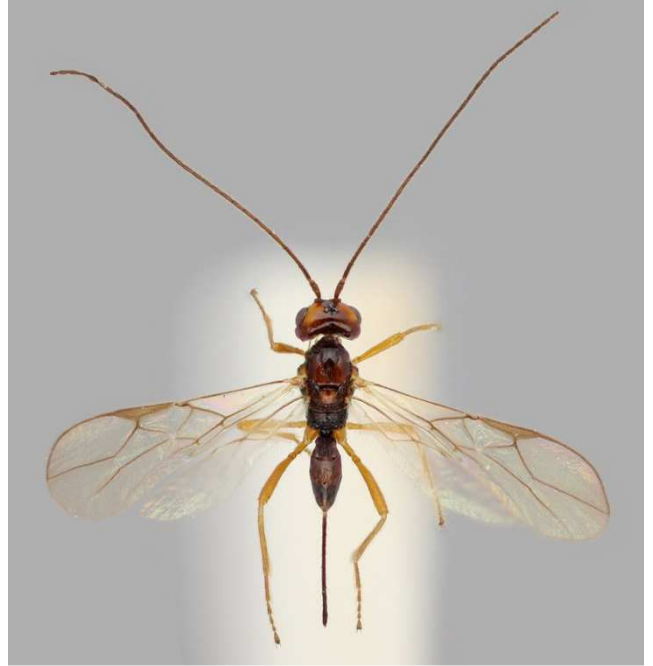


Fig. 6. *Phaenocarpa ruficeps* (Nees), female from Kontiolahti in dorsal view. Photograph taken by Pekka Malinen.
Kuva 6. *Phaenocarpa ruficeps* (Nees), naaras Kontiolahdelta päältä.

Etymology. The specific epithet *kolaensis* is derived from the Kola Peninsula and the ending –*ensis*, meaning a species living in the Kola Peninsula.

Using the key to European *Phaenocarpa* by Fischer (Fischer 1990) the female of the new species runs to the *P. ruficeps*-group and to *P. ruficeps* (Nees, 1812). Also the keys in Tobias (1986) and Belokobylskij (1998) lead to *Phaenocarpa* (*Phaenocarpa*) *ruficeps* or either to *P. kozyrevskii* Belokobylskij, 1998 or to *P. ussurica* Belokobylskij, 1998, which are the other species near to the new species. The mandible of the new species is almost similar to that of *P. kozyrevskii* from Kamchatka, but *P. kozyrevskii* has the mesoscutum with a complete and deep medio-longitudinal groove. *Phaenocarpa ussurica* is larger (body length 3.2-4.2 mm), its antennae have 30-33 segments and first metasomal tergum is about as wide as long.

The females of the new species were compared with three females of *Phaenocarpa ruficeps* from Finland collected by V. Vikberg from *Ta*:

Janakkala, Kalpalinna (6759:3370), 11.8.1995 and 15.8.1995; and *Kb*: Kontiolahti (695:363), 23.8.1972. The females (Fig. 6) of *P. ruficeps* are larger and paler than the females of the new species. The females of *P. ruficeps* have a body length of 2.4-3.0 mm, forewing length of 3.2-3.6 mm, head width of 0.78-0.90 mm and exhibit rich reddish brown colour on head and mesonotum. Their antenna has 25-28 flagellomeres, antenna is distinctly longer than forewing, i.e. 1.16-1.33 times as long as forewing, and the flagellomere 1/flagellomere 2 length ratio is only 0.67-0.72, the shape of mandibular teeth is different, and the 3RSa/2RS length ratio is only 1.00-1.21.

All species of Alysinae are koinobiont endoparasitoids of cyclorrhaphous Diptera (Shaw & Huddleston 1991). The hosts of the widely distributed (Holarctic, Oriental and Afrotropical) species *P. ruficeps* are known (Yu et al. 2005). It has been reared from puparia of several species of *Botanophila*, *Delia*, *Hylemya* and *Pegomya* (Diptera: Anthomyiidae). The hosts of *P. kozyrevskii* and *P. ussurica* are unknown. The hosts of the new closely related species are likely to be species of Anthomyiidae that were reared simultaneously from the feather traps. Of them only *Lasiomma strigilatum* and *L. picipes* could be identified to the species level.

Tiivistelmä

Artikkelissa kuvataan Kuolan niemimaalta Luoteis-Venäjältä tieteelle uusi laji *Phaenocarpa kolaensis*, joka kuuluu vainopistiäisten (Braconidae) heimoon ja sen Alysinae-alaheimoon.

Aineiston hankinta: Tohtori Mikhail V. Kozlov ja hänen työryhmänsä asettivat keinotekoisia linnunpesiä kasvukauden 2001 ajaksi Severonikelin nikkeli-kuparisulattoa ympäröivään metsään Montšegorskissa Kuolan niemimaalla. Pesät koottiin puhdistamattomista kanan sulista ja höyhenistä ja niitä sijoitettiin 14 paikkaan, kuhunkin 3 pesää. Pesät olivat ulkona kesäkuun 17. ja elokuun 5. päivän välisen ajan, sitten ne kerättiin talteen ja kukin pantiin omaan

muoviastiaansa. Astiat pidettiin ulkona Kuolan niemimaalla seuraavaan kesään saakka, jolloin 12. päivä heinäkuuta ne tutkittiin ja kaikki hyönteiset tai niiden jäännökset otettiin talteen pumpulikerrosten päälle. Saatu aineisto käsitti 562 kärpystä, joista 232 kuului heimoon Piophilidae ja 330 heimoon Anthomyiidae. Lajilleen pystyttiin määrittämään vain pieni osa kärpäsiä niiden huonon kunnan takia. Jälkimmäisen heimon yksilöistä 20 tunnistettiin lajiksi *Lasiomma strigilatum* (Zetterstedt) ja 6 yksilöä edusti lajia *Lasiomma picipes* (Meigen). Myös kaksi loispistiäislajia löytyi aineistosta. Näistä 17 yksilöä kuului sukuun *Trybliographa* (Cynipoidea, Figitidae, Eucoilinae). Näistä neljä yksilöä lähetettiin Ruotsiin tohtori Mattias Forshagelle tunnistettavaksi. Osoittautui, että ne kuuluvat kuvaamattomaan lajiin, jolle esitettiin Forshagen väitöskirjassa (2009) nimeä *Trybliographa ptilicola* Forshage ja Nordlander. Jakelusta johtuen nimi ei ole vielä käyttökelpoinen, vaan se on julkaistava uudestaan. Loispistiäisistä 71 yksilöä kuului sukuun *Phaenocarpa* (Ichneumonoidea, Braconidae, Alysinae). Tämä laji kuvataan artikkelissa tieteelle uutena.

Phaenocarpa (Phaenocarpa) kolaensis sp. n.

Lajin naaras (Kuvat 1 ja 2) on lähes musta, vain sen jalat ovat vaalean ruskeat. Naaraan ruumiinpituus on 1,6-2,6 mm ja etusiiven pituus 2,0-3,0 mm. Tuntosarvessa on 20-22 siimajaoketta ja tuntosarvi on hieman lyhyempi kuin etusiipi, pituus 0,95 kertaa etusiiven pituus. Leuka on lyhyt ja keskiviivassa 1,5 kertaa maksimileveytensä pituinen. Leuan kärjessä (Kuva 3) on kolme hammasta, joista ylin hammas on leveä, keskimäinen hammas on pisin, kapea ja terävä ja pieni alin hammas hieman käyrä. Takaruumiin 1. selkäkilpi (Kuva 4) levenee taaksepäin ja on 1,1-1,3 kertaa kärkileveytensä pituinen. Munanasettimen suojuus on takaruumiin pituinen.

Koiras (Kuva 5) muistuttaa paljon naarasta. Sen tuntosarven siimassa 22-24 jaoketta ja tuntosarven pituus on 1,3 kertaa etusiiven pituus.

Holotyypit, naaras: Venäjä, Murmanskin alue, 18 km etelään Montšegorskista, höyhenpyydys 1239-1, pyyntiaika 17.6.-5.8.2001, tarkastettu 12.7.2002; leg. A. Vassiliev, V. Zverev & M. V. Kozlov.

Paratyypit: 12 naarasta ja 8 koirasta, joiden ottotiedot samat kuin holotyypillä; 24 naarasta ja 12 koirasta muista höyhenpyydyksistä 13,8 km tai 27 km etelään Montšegorskista vuodelta 2001. Holotyypit sijoitetaan Luonnontieteelliseen keskusmuseoon Helsinkiin ja paratyypit ovat samassa museossa, Kansallisessa Luonnontieteen Historian Museossa (Naturalis) Leidenissä ja lajin kuvaajan kokoelmassa Turengissa.

Palearktisten lajien tutkimuskaavassa (Fischer 1990) ja Venäjän Euroopan puoleisen osan lajien tutkimuskaavassa (Tobias 1986) uuden lajin naaraat menevät lajiin *Phaenocarpa ruficeps* (Nees). Venäjän Kaukoidän lajien tutkimuskaavassa (Belokobylskij 1998) tullaan samaan lajiin tai sille läheisiin lajeihin *P. kozyrevskii* Belokobylskij ja *P. ussuriensis* Belokobylskij. Suomen lajeista *Phaenocarpa ruficeps* on uudelle lajille läheisin, mutta se on tätä hieman suurempi, sen naaraan ruumiinpituus 2,4-3,0 mm ja etusiiven pituus on 3,2-3,6 mm. Sen naaraan tuntosarven siimassa on 25-28 jaoketta, tuntosarvi on selvästi (1,16-1,33x) pitempi kuin etusiipi, ja päässä ja keskiruumiissa on runsaasti punaruskeaa väritystä (Kuva 6).

Alysiinae-alaheimon lajit ovat koinobioottisia tynnyrikotelokärpästen sisäloisia. Koinobioottisella parasitoidilla on viivästynyt yksilönkehitys. *Phaenocarpa ruficeps* -laji on ulkomailla kasvatettu useiden *Botanophila*, *Delia*, *Hylemya* ja *Pegomya* -lajien (Diptera, Anthomyiidae) puparioista (Yu ym. 2005). Ilmeisesti uudenkin lajin isäntiä ovat heimon Anthomyiidae kärpäset, mitkä kasvatettiin keinotekoisista pesistä samalla kertaa.

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The specimens of the new species were reared by Dr. Mikhail V. Kozlov and his team and given to the author for identification. The data on the rearing mentioned in the Introduction are from Mikhail Kozlov. He also helped my

work by translation of some parts of Belokobylskij (1998) into English. Some partly damaged specimens were sent to Dr. Kees van Achterberg, Leiden and he recognized the species as new to science. Kees van Achterberg kindly checked and corrected the description of the new species. Pekka Malinen took the photos of the specimens of *Phaenocarpa kolaensis* and *P. ruficeps*. Gergely Varkonyi acted as a referee and improved the manuscript considerably.

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