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Europs insterburgensis sp. nov., a new root-eating beetle from
Baltic amber
(Coleoptera: Monotomidae)

VITALII I. ALEKSEEV

Department of Zootechny, Kaliningrad State Technical University, Sovetsky av. 1. 236000 Kaliningrad,
Russia. E-mail: alekseew0802@yahoo.com

ABSTRACT. The extinct representative of the family Monotomidae LAPORTE, 1840 is described from Baltic amber. *Europs insterburgensis* sp.nov. differs from other representatives of the genus by the wide head, by the coarsely punctate forebody, by the uniform body color and by antennal proportions.

Key words: entomology, taxonomy, Coleoptera, Monotomidae, *Europs insterburgensis*, new species, Baltic amber, Tertiary, Eocene.

INTRODUCTION

Root-eating beetles (Monotomidae LAPORTE, 1840) is a family of small (1.5-6.0 mm) predaceous or mycophagous cucujoid beetles, distributed worldwide. There are currently 33 genera with about 250 described species (SLIPINSKI et al. 2011), divided into two subfamilies: Rhizophaginae REDTENBACHER, 1845 and Monotominae LAPORTE, 1840 (BOUCHARD et al. 2011). The family of the root-eating beetles has been known from Baltic amber. The fossil representatives of Monotomidae are rather rare in the collections of Baltic amber: one specimen is known from Copenhagen museum, five specimens are deposited in Berlin museum, two specimens in Warsaw museum (KULICKA & SLIPINSKI 1996), and one specimen in Gdańsk collection (KUBISZ 2001). No extinct species and genera of Monotomidae from Baltic amber have been described (ALEKSEEV 2013).

The genus *Europs* WOLLASTON, 1854 includes about 50 described extant species distributed in North and South Americas, Asia, Africa and Madagascar. The taxonomy of the genus is poorly studied, no subgenera (except one disputable taxon *Monotopion*

REITTER, 1884 from Japan) have been recognized and the genus has never been revised (BOUSQUET 2003a). Five other extant species of the genus occur in the Palaearctic region (JELÍNEK 2007): *E. temporis* REITTER, 1884 [Japan, Far East]; *E. duplicatus* WOLLASTON, 1862 [Canary Islands]; *E. impressicollis* WOLLASTON, 1854 [Canary and Madeira Islands]; *E. indicus* GROUVELLE, 1903 [India]; *E. alutaceus* CHAMPION, 1924 [India]. The recent beetles of the genus are found under bark of dead trees or are associated with cultivated plants and possibly feed on spores of ascomycetes. The genus *Europs* WOLLASTON was also recorded from Baltic amber: in KLEBS (1910, p. 241) as belonging to family Nitidulidae and in SPAHR (1981, p.35) as belonging to family Cucujidae.

In the current paper a new species of Monotomidae, from Eocene Baltic amber, assigned to the recent genus *Europs* WOLLASTON, 1854, is described, illustrated and compared with the recent Holarctic species.

MATERIAL AND METHODS

The beetle inclusion is preserved in a polished piece of amber, yellowish in color, without supplementary fixation. The amber piece is relatively large and elongate (52 x 30 x 10 mm) and was obtained from a commercial source in Kaliningrad in February 2013. It has been polished by hand, thus allowing dorsal and lateral views of the included beetle. Additional inclusions of obvious animal origins are represented by: one larva of Coleoptera (possibly of the same monotomid beetle), one winged ant, one other Hymenoptera and one small spider. The syninclusions of plant and possibly plant origin are also present: there are a few stellate hairs (possibly from the buds of an oak) as well as leaf-like fragments of (possibly) a lichen. The piece is deposited in the private collection of the author (Kaliningrad, Russia). The type will be deposited in the Paleontological Institute, Russian Academy of Science (Moscow) for permanent preservation.

Photos were taken with a Zeiss AxioCamICc 3 digital camera mounted on a Zeiss Stemi 2000-cstereomicroscope. Illustrations were made based on free-hand drawing during examination of the original specimen.

The following measurements were made using an ocular micrometer in a stereoscopic microscope at 56x: maximum width of head, including eyes (WH); maximum width of pronotum in the first fourth of its length (WP); length of pronotum along midline (LP); length of elytra from posterior extremity of scutellum to tip of elytron (LE). The following sources were used for the generic attribution and comparison with recent species: NIKITSKY (1986), BOUSQUET (2003a), BOUSQUET (2003b).

TAXONOMY

Family Monotomidae LAPORTE, 1840
Subfamily Monotominae LAPORTE, 1888
Tribe Europini SEN GUPTA, 1988
Genus *Europs* WOLLASTON, 1854

***Europs insterburgensis* sp.nov.**

(Figs. 1-2)

MATERIAL EXAMINED

Holotype Nr. AWI-077, possible female (one exposed tergite of abdomen, short and truncate temples); a complete beetle with distal parts of left posterior wing partly exposed from under the apex of elytron. The beetle inclusion is slightly damaged: the elytra and disc of pronotum are asymmetrically impressed and slightly deformed, because of thermal processing of the amber piece in an autoclave.

TYPE STRATA

Baltic Amber. Eocene.

TYPE LOCALITY

Baltic Sea coast, Yantarny settlement [formerly Palmnicken], the Kaliningrad region, Russia.

DIFFERENTIAL DIAGNOSIS

The new species may be assigned to *Europs* WOLLASTON because of the following morphological characters: head without antennal grooves, procoxae slightly transverse and rounded, antenna with 3-segmented club (apparently 2-segmented), pronotal disc with impunctate median zone, elytral disc with punctures arranged in longitudinal rows, first visible abdominal sternite without median plaque bearing setae. The author assumes that the inflexed part of elytron has three rows of punctures but the lateral or



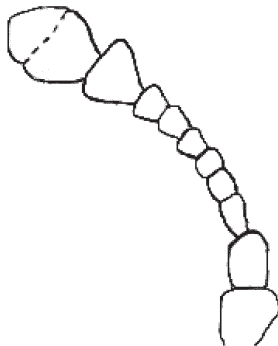
1. *Europs insterburgensis* sp. nov., habitus in dorsal view

latero-ventral view is impossible for this inclusion and the beetle is slightly deformed. It is difficult to separate the genera *Europs* WOLLASTON and *Aneurops* SHARP, 1900 on the base of a female specimen (the females of both species are morphologically very close to each other and have no median plaque on the first ventrite). According to BOUSQUET (2003a) the North American representatives of *Europs* have the total length 1.8-2.9 mm, whereas two described species of *Aneurops* (from southwestern US/Mexico and from Guatemala) are comparatively larger and have the body length 2.2-4.7 mm. The length of our specimen (2.1 mm) allows assigning of the fossil to *Europs* species.

The new species differs from extant congeners by wide head, uniformly dark body color, coarse punctation of pronotum and head. *Europs insterburgensis* sp.nov. resembles recent *Europs temporis* REITTER, 1884, but can be easily separated from that species by wide head, uniform body color, round punctures on pronotum, elytra with indistinct setae, longer body and by antennal proportions (longer third antennomere, wider second antennomere). A new species can be distinguished from *E. striatulus* FALL, 1907 by shorter elytra, from *E. flavidus* BOUSQUET, 2003 by wider head and not narrowly furrowed lateral margins of pronotum, from *E. frugivorus* BLATCHLEY, 1928 by punctation of pronotum not aligned in shape of horseshoe, from *E. fervidus* BLATCHLEY, 1928 by more dense and coarse punctation of the head, from *E. pallipennis* (LECONTE, 1861) by lesser body size and absence of impunctate median area on the front, from *E. sulcicollis* BOUSQUET, 2003 by absence of paired grooves on the pronotal disc. Unfortunately, the coxal bead of the first ventrite is invisible due to hind legs position.

DESCRIPTION

General. Body elongate, flattened, glabrous (Fig. 1). Body length = 2.1 mm, LP = 0.55, WP = 0.5 mm, WH = 0.5 mm, LE = 0.85 mm; pygidial length 0.14 mm. Colouration uniformly dark brown. Pubescence: setae on upper surface of body indistinct at 56x, tarsi and antennae with fine pubescence. *Head.* WH/WP = 1; front coarsely and dense punctured, the punctation on the frons is slightly finer than on the pronotum. The area between eyes with flat depression. Eyes convex, large and prominent, finely faceted. Temples short, 0.25x longitudinal diameter of eye, truncate. Antennae (Fig.



2. *Europs insterburgensis* sp. nov., antenna

2) reach the 1/3 of pronotal length; with 3-segmented antennal club (the club seems to be 2-segmented because fused antennomeres X and XI); antennomere IX transverse, as wide as antennomeres X and XI; scape (first antennomere) broader than segments II-VIII; antennomere III slightly shorter than antennomere II and longer than antennomeres IV-VIII. *Pronotum* slightly elongate (LP/WP=1.1); lateral margins not furrowed, more or less parallel, slightly convergent posteriorly; lateral sides crenulated; anterior angles rounded, not protruding; disc without grooves, rather flat; smooth, longitudinal, median impunctate area narrow (as wide as diameters of 2-2.5 punctures), about same width in anterior and posterior half; pronotal punctation round, irregular, coarse and dense on disc and on sides (slightly denser as on head surface); microsculpture indistinct. *Elytra* bare (without visible accumbent setae at 56x), each with rows of punctures forming striae, relatively short (LE/LP = 1.56), widest just before middle, truncated at the apex, exposing one abdominal tergite. Hind wings present. Scutellum oval, longitudinal, without setae. *Abdomen* 5-segmented, last visible sternite without modifications, densely and finely punctured; first ventrite without median setigerous plaque; the coxal bead of first ventrite obscured by hind legs. Tergite finely punctured. *Legs* with tarsal formula 4-4-4; femora wide; tibiae slightly curved. Ultimate tarsomere longer than all previous together.

DERIVATIO NOMINIS

The species name is derived from Insterburg, the German name of the town Chernyakhovsk in Kaliningrad Region (Russia), the birthplace of the author.

DISCUSSION

The age of the Baltic amber ranges from Early to Late Eocene. During the millions of years comprising Middle and Late Eocene large amounts of resin were transported by rivers from Fennoscandia into marine Baltic deposits. Single pieces of Baltic amber are therefore not assignable to specific strata and horizons. The sediments containing the majority of Baltic amber in the Kaliningrad area are 47–38 million years old (RITZKOWSKI 1999). The Baltic amber forests grew in Eocene Scandinavia in a temperate to subtropical climate. Members of an arctotertiary flora of a circumboreal temperate climatic zone such as deciduous trees and members of a palaeotropical flora with evergreen trees and numerous palms grew together in this area (DÖRFELT & SCHMIDT 2007.). The fauna of Coleoptera from Baltic amber has also the mixed (temperate-subtropical) character with affinities to the contemporaneous Oriental region, Mediterranean region, western and eastern North American coasts and lesser to Australian and Neotropical areas. The current distribution of *Europs* genus suggests that *Europs insterburgensis* sp.nov. was a subtropical element of the Eocene Baltic fauna.

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