Melanophila formaneki (Jakobson) (Coleoptera, Buprestidae) new to Finland

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The buprestid *Melanophila formaneki* (Jakobson) (= *Phaenops aerea* Formanek) is reported for the first time from Finland. The beetles (5 adults and 32 larvae) were reared from three stems of recently dead approx. 4-m-high Scots pines (*Pinus sylvestris* L.). The pines had been cut in a heavily polluted industrial area at Harjavalta, southwestern Finland, in 1989. A specimen collected in 1929 from Sakkola, on the Karelian Isthmus, was redetermined in museum material. *M. formaneki* is compared with *M. cyanea*, and the larva is described.

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1. Introduction

Most of the North European buprestids develop as larvae in the cambium and wood of trees and shrubs. In general, buprestids are rather rare, and several Finnish species associated with old forests or forest fires have been considered to be threatened. On the other hand, wood-inhabiting buprestids have usually been regarded as secondary pests mainly attacking dying trees. The larvae of some species have caused mechanical damage to wood in Central Europe (Schönherr 1974), but due to their rarity the Scandinavian species have been of practically no economic importance (Bíly 1982), with the exception of some local damage in buildings caused by *Buprestis haemorrhoidalis* Herbst.

When studying the effects of heavy industrial air pollution on insects and forest decline, we reared wood-inhabiting insects from Harjavalta in 1989. These rearings resulted in the emergence of buprestids of the species *Melanophila formaneki* (Jakobson) which is here reported as a new species for Finland. A review of the genus, with a key to the adults is in course of preparation in Sweden by W. Kronblad and B. Ehnström. Thus, we will only briefly describe the differences between this species and *M. cyanea* (Fabricius). We have also included descriptions of the Finnish habitat and the larva.

2. Biogeography

The reared buprestids were at first identified as *Melanophila cyanea* (Fabricius). However, a closer examination was necessary since, in addition to *M. cyanea cyanea*, another subspecies,

M. cyanea aerea (Ganglbauer), was recently observed in Sweden. This subspecies was formerly known from the eastern Mediterranean region. Furthermore, another species belonging to the same genus, *M. formaneki* (Jakobson), was also discovered in Sweden (B. Ehnström and W. Kronblad, unpubl.). The reanalysis of the new Finnish material showed that these beetles belonged to *M. formaneki*, which is a very rare species (Bíly 1976). A couple of individuals were sent to Sweden, where W. Kronblad confirmed their identification.

M. formaneki has three subspecies in Europe: *M. f. formaneki*, *M. f. lavagnei* (Thery) and *M. f. bohemica* (Bíly) (Bíly 1976). The Finnish and Swedish individuals belong to the nominal subspecies which is known from Dalmatia, the southern parts of Central Europe and the Ukraine, as well as from Siberia (Horion 1955, Bíly 1976, Harde 1979). *M. cyanea* ranges through most of Europe to Siberia and Mongolia, in addition to Algeria and Morocco (Bíly 1982). It is rare in Finland.

The examination of the *Melanophila* material in the Finnish Museum of Natural History (Zoological Museum) and in the Department of Agricultural and Forest Zoology, University of Helsinki, revealed one specimen of *M. formaneki* collected from Sakkola, on the Karelian Isthmus (U.S.S.R), on 13th July 1929 by P. Kontkanen. The rest of the material was referable to *M. cyanea*: 28 individuals from Finland (provinces V, U, EH, ES, PH, PS), 1 from Viborg and 40 from Eastern Karelia (U.S.S.R.). The museum material also included two old specimens of *M. formaneki* from Yakutia (Poppius leg.).

3. Nomenclature and diagnostics

The genus *Phaenops* Lacordaire has often (e.g. Silfverberg 1979) been included in *Melanophila* Eschscholtz, but Bíly (1982), among others, considers it a separate genus. Westwood in 1838 first identified the type of *Melanophila* as *Buprestis tarda* Fabricius, 1792 (= *Buprestis cyanea* Fabricius, 1775). Thus, those species considered under the genus *Phaenops* until recently belong to *Melanophila*, while the valid name for *Melanophila acuminata* is *Oxypteris acuminata* (De-

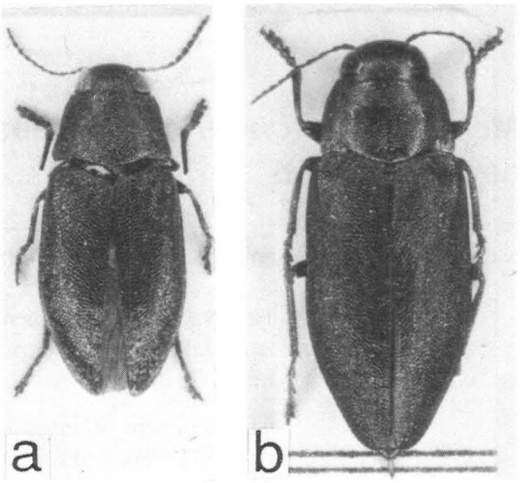

Fig. 1. Adults of *Melanophila*. — a: *M. formaneki*, — b: *M. cyanea*.

Geer, 1774) (for details, see Nelson 1989). *M. formaneki* (Jakobson) was first described by Formanek (1900) as *Phaenops aerea*, but this name is a homonym of *P. cyanea* var. *aerea* Ganglbauer, 1886. Thus, the junior synonym *M. formaneki* (Jakobson, 1913) is the valid name for Formanek's species (Müller 1986).

M. formaneki can be distinguished from *M. cyanea* on the basis of the male genitalia (especially parameres) and the more slender middle segments of the antennae (Bíly 1976). The following characters of *M. formaneki* can also be used in the identification of adult beetles:

1) pronotum with regular and rounded punctures (in *M. cyanea* punctures irregular and transverse);
2) posterior part of elytra clearly pubescent (in *M. c. cyanea* elytral pubescense very indistinct, but in *M. c. aerea* the whole elytra pubescent);
3) coloration green or bronze (in *M. cyanea* usually dark blue or violet with pronotum and elytra often of different colour);
4) *M. formaneki* is usually smaller (length 6.3–9.6 mm) than *M. cyanea* (Fig. 1).

The larva of *M. formaneki* is very similar to that of *M. cyanea* (Fig. 2). It has an enlarged prothorax, pronotal grooves forming an inverted

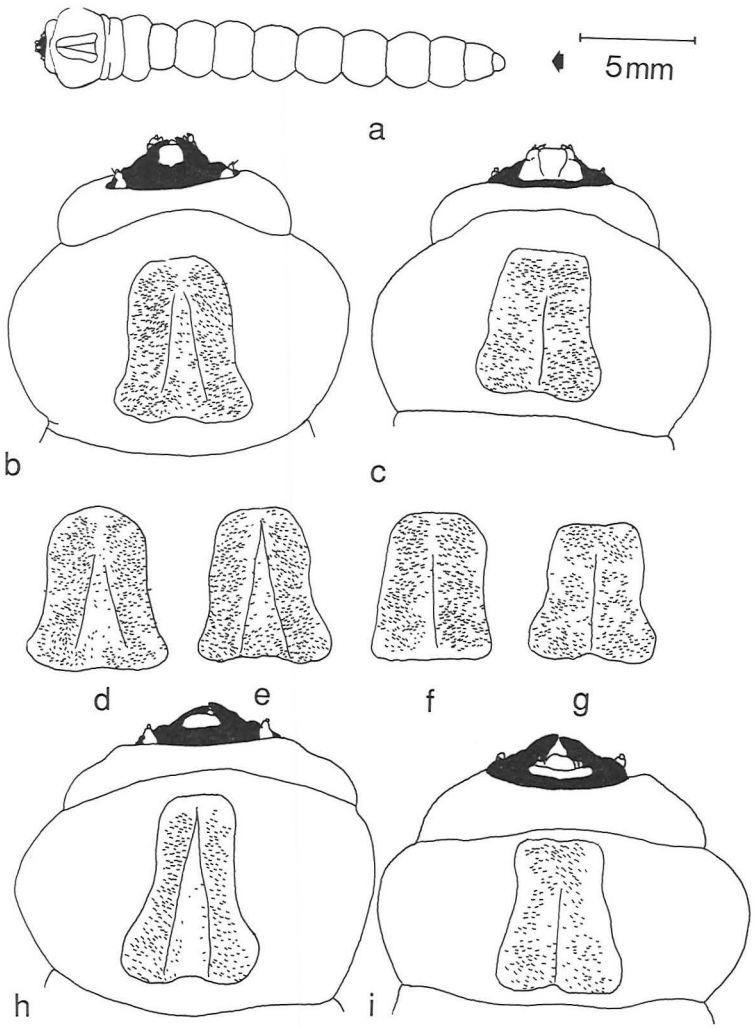

Fig. 2. Larvae of *Melanophila*. — *M. formaneki* (Harjavalta 1989). — a: general habitus; b: prothorax, dorsally; c: prothorax, ventrally; d–e: pronotal asperities; f–g: prosternal asperities. — *M. cyanea* (Yläne 1917, U. Saalas leg.); h: prothorax, dorsally; i: prothorax, ventrally.

V and well-developed fields of sclerotized asperities on the pronotum and prosternum. The pronotal field of the asperities appears to be wider and more rectangular in *M. formaneki* than in *M. cyanea*.

4. Habitat and biology

M. formaneki occurred in the standing trunks of recently dead Scots pines (*Pinus sylvestris* L.) (mean height approx. 4 m, mean diameter at breast height approx. 7 cm) in an industrial area at Harjavalta, southwestern Finland (61°20′N, 22°10′E). The natural vegetation of the area consists of plant species typical of eskers and dry upland forest sites (*Calluna vulgaris*, *Empetrum nigrum*, *Vaccinium vitis-idaea*, *Arctostaphylos uva-ursi* etc.). A heavy pollution load emitted by a copper smelter and a fertilization factory has almost totally destroyed the vegetation in the habitat, and the forest floor is covered by soot. Atmospheric pollution has weakened pines in the area, exposing them as suitable breeding material for bark beetles and several other insect species (Fig. 3).

A total of 5 adults of *M. formaneki* were reared from 3 pine stems. In addition, 32 larvae

Fig. 3. Habitat of *P. formaneki* at Harjavalta.

were found in the same stems. *Pissodes piniphilus* (Herbst) (Curculionidae), *Rhagium inquisitor* (L.) (Cerambycidae) and *Tomicus piniperda* (L.) (Scolytidae) were abundant in the same pines.

M. formaneki has been recorded from several species of pines (*Pinus sylvestris*, *P. uncinata*, *P. salzmanni*, *P. nigra austriaca*, *P. halepensis*, *P. mugo rotundata*), but not from other conifers (Horion 1955, Bíly 1976, Hellrigl 1978), while *M. cyanea* sometimes also lives on spruce (Saalas 1949). *M. formaneki* differs from *M. cyanea* in preferring smaller trees, especially pines growing on bogs. In taller trees it prefers the thinner parts of stems and branches (Hellrigl 1978). The Swedish individuals have been reared from small pines growing on bogs or pine heaths, as well as from branches and burned trees from a clear-cut area. (B. Ehnström and W. Kronblad, unpubl.).

5. Discussion

The present finding shows that *M. formaneki* is tolerant to industrial air pollutants and may even be favoured by them. Some hypotheses may be put forward to explain the success of this species in such an environment. Both *M. formaneki* and *T. piniperda* breed under thick bark in dying conifers. *T. piniperda* swarms early in the spring (April–May) and usually reaches the dominant position in the breeding material. As a consequence, when attack density is high, no phloem is left for the late-swarming buprestid (see Löyttyniemi & Uusvaara 1977). However, in heavily polluted areas there exist at any given time several different phases of dying conifers and the tree death may be less restricted to the wintertime, which could decrease interspecific competition and offer breeding material for late swarming species as well.

The polluted environment with its dark unshaded trunks may contain hot microhabitats when the sun shines and thus be preferred by heliophilous buprestids. To a certain degree the landscape resembles burnt forests, which attract the closely related *M. cyanea* and *Oxypteris acuminata* (DeGeer) (Bíly 1982). In Central Europe *M. cyanea* has been observed to abound near industrial sources (Bösener 1969, Schönherr 1974) in contrast to previous studies by Templin (1961). There are also signs that the species has recently increased in numbers in West Germany (Schönherr 1974). *M. cyanea* is considered to be a secondary pest of dying pines and spruces (Saalas 1923). Although it is known to cause some blueing in the wood, it is not usually

regarded as injurious to timber (Sierpinski 1971, Koehler & Kolk 1974). However, in connection with drought *M. cyanea* has repeatedly killed Scots pines in Sweden during the last few decades (Ehnström et al. 1974, Löyttyniemi et al. 1979). In some stands in Central and eastern Europe *M. cyanea* may be even more harmful than *Tomicus piniperda*, which often exploits the same trees (Schönherr 1974). It remains to be seen if similar trends will be true also for *M. formaneki*.

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References

Bíly, S. 1976: Phaenops formaneki Jakobson (Coleoptera; Buprestidae), with the description of a new subspecies. — Acta Entomol. Bohemoslov. 73:32–35.

— 1982: The Buprestidae (Coleoptera) of Fennoscandia and Denmark. — Fauna Entomol. Scand. 10:1–109.

Bösener, R. 1969: Zum Vorkommen rindenbrütenden Schadinsekten in rauchgeschädigten Kiefern- und Fichtenständen. — Arch. Forstwes. 18:1021–1026.

Ehnström, B., Bejer-Petersen, B., Löyttyniemi, K. & Tvermyr, S. 1974: Insect pests in forests of the nordic countries 1967–1971. — Ann. Entomol. Fennici 40:37–47.

Formanek, R. 1900: Synoptische uebersicht der Phaenops-Arten aus der palaerktischen Fauna. — Wien. Entomol. Zeit. 19:167–168.

Harde, K. W. 1979: 38. Fam. Buprestidae. — In: Freude, H., Harde, K. W. & Lohse, G. A. (eds.): Die Käfer Mitteleuropas, Band 6. Diversicornia: 203–230. Krefeld.

Hellrigl, K. G. 1978: Ökologie und Brutpflanzen europäischer Prachtkäfer (Col., Buprestidae). — Zeitschr. Angew. Entomol. 85:167–191, 253–275.

Horion, A. 1955: Faunistik der Mitteleuropäischen Käfer. Band IV. — Entomol. Arbeit. Mus. Frey, München. 280 p.

Koehler, W. & Kolk, A. 1974: Untersuchungen über den Einfluss der Sommerfällung auf die Populationsdynamik der Sekundärschädlinge. (In Polish with German summary) — Prace Inst. Bad. Lesn. 463:3–58.

Löyttyniemi, K., Austarå, Ø., Bejer, B. & Ehnström, B. 1979: Insect pests in forests of the Nordic Countries 1972–1976. — Folia Forest. 395:1–13.

Löyttyniemi, K. & Uusvaara O. 1977: Insect attack on pine and spruce sawlogs felled during the growing season. — Comm. Inst. Forest. Fenn. 89(6):1–48.

Müller, J. 1986: Coleopterologische Notizen. — Wien. Entomol. Zeit. 43:167–171.

Nelson, G. H. 1989: Remarks on genera of Buprestidae affected by the Leraut (1983) and Cobos (1986) papers (Coleoptera). — Coleopterists Bull. 43:393–396.

Saalas, U. 1923: Die Fichtenkäfer Finnlands. Studien über die Entwicklungsstadien, Lebensweise und geographische Verbreitung der an Picea excelsa Link. lebenden Coleopteren nebst einer Larvenbestimmungstabelle. II. — Ann. Acad. Sci. Fennicae A 22:1–746.

— 1949: Suomen metsähyönteiset. — Porvoo. 719 p.

Schönherr, J. 1974: Buprestidae. — In: Schwenke, W. (ed.): Die Forstschädlinge Europas. 2:31–55. Paul Parey, Hamburg und Berlin.

Sierpinski, Z. 1971: Harmful insects in forest stands on farm abandoned land. (In Polish with English summary) — Sylwan 115:1–17.

Silfverberg, H. (ed.) 1979: Enumeratio Coleopterorum Fennoscandiae et Daniae. — Helsinki. 79 p.

Templin, E. 1962: Zur Populationsdynamik einiger Kiefernschadinsekten in rauchgeschädigten Beständen. — Wiss. Zeitschr. Techn. Univ. Dresden 11:631–637.

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