

## Distribution of *Atherix ibis* (Diptera, Athericidae) in Fennoscandia

J. Itämies, K. Kuusela & K. Karvonen

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The Finnish distribution of *Atherix ibis* (Fabricius) was surveyed by searching for the female cones, or clusters, from the underside of bridges, by kick-net sampling (2 min) in the running water habitats and by newspaper inquires. Additional records were received from our colleagues, as well as from neighbouring countries. *A. ibis* was found in Finland from ten biogeographical provinces forming a clear northern and eastern distribution. The Fennoscandian distribution acquired a western extension due to recent discoveries in northern Sweden.

*J. Itämies, K. Kuusela & K. Karvonen, Department of Zoology, University of Oulu, Linnanmaa, FIN-90570 Oulu, Finland*

### 1. Introduction

*Atherix ibis* (Fabricius, 1798), the Ibis fly, is a brachycheran fly assigned with other species to their own family Athericidae by Stuckenberg (1973). It is the only Finnish species of the genus (Hackman 1980). The published records of *A. ibis* from Finland have indicated a northerly distribution (Frey 1911, 1950, Itämies et al. 1990). The aim of this contribution is to give up-to-date information on its occurrence in Finland based upon the collecting carried out by us mainly in 1989–92. The Fennoscandian distribution — including north-western Russia — will also be reviewed.

### 2. Material and methods

To study the Finnish occurrence of *A. ibis*, firstly the undersides of bridges crossing the rivers (on

pool sections as well) were inspected for the female clusters. The field trips were directed at northern and eastern Finland in 1989 (mainly in August), at Central Ostrobothnia in 1991, and at Northern Tavastia and Northern Savonia in 1992. Secondly, kick samples (2 min.) from the river bottom were also taken. Thirdly, inquiries were made via local newspapers. Additional observations were reported by our colleagues (see acknowledgements). Information in the literature on macroinvertebrate studies in Finnish rivers was also made use of.

In the case of other countries, material and information was received as follows: Zoological Museums of Helsinki and Turku, Zoological Museum of Russian Academy of Sciences in St. Petersburg, data from the Kola Peninsula and Carelia by Dr. Vladimir Khrennikov (Petrozavodsk), together with excellent samples from Sweden by Drs Eva Engblom and Pär-Erik Lingdell (Skinnskatteberg) and from Norway by Dr. Lita Greve (Bergen).

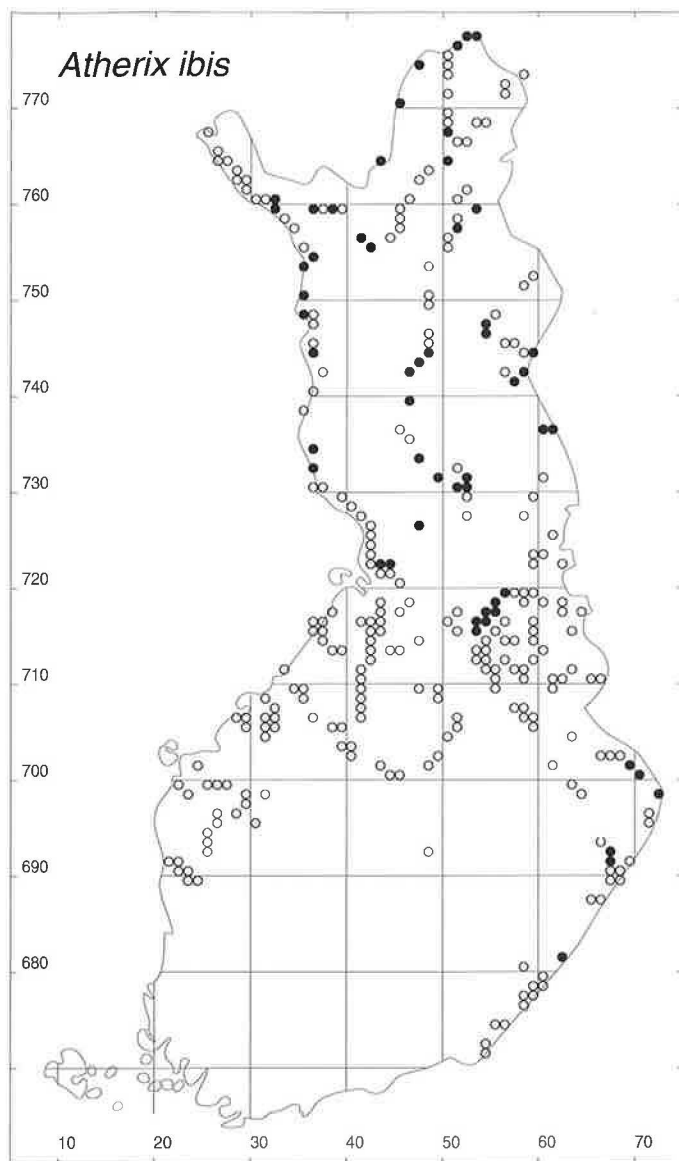


Fig. 1. Distribution of *Atherix ibis* (Fabricius) in Finland. Filled dot = positive find; open dot = negative find.

### 3. Results and discussion

The Ibis fly was recorded from northern Lapland to southeastern Finland, the main area being northern Finland (Fig. 1). Here the occurrences were distributed rather evenly, but the north-western part of the province of Enontekiö Lapland (*EnL*), the most alpine area in Finland, did not produce any flies. As the main roads were used for travelling, the observations follow these. Evi-

dence of the occurrence of the species is lacking from an area south of Oulu district, in spite of intensive searching. Only a few records were obtained from southeastern Finland. The species thus seems to be totally lacking from South, Central and West Finland. Thus, in Finland this fly is a northern and eastern species and the biogeographical provinces from which *A. ibis* has so far been recorded are the following: *LK*, *PK*, *Kn*, *PPs*, *PPn*, *Ks*, *KemLw*, *KemLe*, *EnL* and *InL*.

Altogether 413 observations were made, representing 296 separate squares (10 km × 10 km), of which 55 were positive.

Our present finds confirm the earlier ones presented by Frey (1911, 1950) and Itämies et al. (1990) clearly defining the southern border of the area of distribution of the fly in Finland. Within its area the species seemed to occur sporadically. In many of our sampling sites the flow velocity was very slow, thus possibly explaining the absence of the species, whose larvae tend to inhabit rapids with an average velocity of between 0.6–0.7 m/s (Thomas 1976).

In consideration of the ecological demands of *A. ibis* larvae, it is difficult to see why the fly is not found in the area of Central Ostrobothnia and Central Finland in general, which is confirmed also by the fact that it is not mentioned in many studies on lotic benthos made in that area (Kuusela 1969, Kuusela 1980, Anttila 1985, Nyman et al. 1986, Prof. Pauli Bagge pers. comm.). Suitable rapids and water velocities (c.f. Thomas 1976) are frequently available. It is hard to believe even that there is a shortage of oviposition sites. Here the water quality hardly differs so much from the northern rivers that it would explain the absence of the fly, especially as Thomas (1985) found the species to tolerate even a high agricultural nutrient content.

The observations by Thomas (1976) show the species to occur in waters where the temperature reaches at least 13–14°C for the two to three warmest summer weeks at low and medium altitudes. Throughout southern Finland this temperature regime is normally attained very well (see Leppäjärvi 1991), but in some of the rivers discharging into fell districts in the northern calotte these conditions may be not achieved. The River Teno, however, seems to be suitable for *A. ibis*, as Lax et al. (1991) show.

The general distribution of *A. ibis* is palearctic (Thomas 1978). Although the species lives close to the northernmost Barentsian coast (Lax et al. 1991, Greve 1981, Greve pers. comm.), it does not appear to reach the western shore of Norway, but according to present knowledge stays in the eastern parts of northern Sweden (Fig. 2). In Sweden it is considered a rare species which is threatened by water regulation, eutrophication

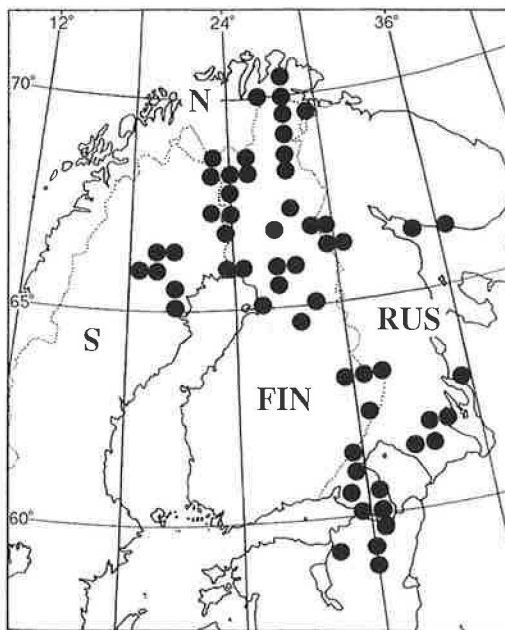


Fig. 2. The distribution of *Atherix ibis* (Fabricius) in Fennoscandia and NW Russia (see sect. Material and methods).

and acidification (Andersson et al. 1987). The extensive collecting by Engblom and Lingdell (pers. comm.) all over Sweden did not essentially change the opinion as to its rarity. The postglacial dispersal routes into the Nordic countries seem to be from the east and south-east, but the occurrence of *A. ibis* in Denmark (Ussing 1924) indicates a possible southern (western European) route, too. This kind of bipartite distribution may be detected in many species, often causing separate southern and northern populations in Fennoscandia (see Thienemann 1950).

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