# First report of *Idiopterus nephrelepidis* Davis, 1909 (Hemiptera: Aphididae) from Bulgaria

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**Abstract**. *Idiopterus nephrelepidis* (Hemiptera: Aphididae) is reported for the first time in Bulgaria on ornamental ferns in four greenhouses in Sofia and Varna. Dense colonies of apterous viviparous females and larvae were observed. The established host plants are *Nephrolepis exaltata, Asplenium nidus* and *Pteris cretica*. Infested ferns exhibit leaf deformation. The aphids were reared in laboratory conditions for four months. A morphometric study of apterae was carried out. Taking into account the presence of host plants of *I. nephrelepidis* in Bulgaria which are native to the local flora and the reports of the aphid from the Balkan area, it may spread in the country outdoors.

Key words: Idiopterus nephrelepidis, Aphididae, greenhouse, alien pest, Bulgaria.

## Introduction

Aphids are among the most important pests on greenhouse ornamentals. In recent years, Bulgaria has intensively imported exotic ornamental plant species from countries in Europe, the Near and Middle East, South America and Africa. Alien pests enter the country on their hosts. One particular example is the species *Idiopterus nephrelepidis*.

## **Materials and Methods**

The aphids were collected in 2009 and 2010 on ornamental ferns in greenhouses in Varna and Sofia, Bulgaria. The insects were fixed in 70% ethanol. Permanent microscope slides were prepared, using 10% KOH for maceration, chloralphenol for brightening, and Berlese's medium for mounting. The slides are deposited in the collections of the Department of Zoology and Anthropology of Sofia University and the Department of Plant Pathology and Chemistry of University of Forestry.

The following length measurements were taken from 28 apterous viviparous females, collected form *Asplenium nidus* L., in a greenhouse in Varna: body (LB); body width (WB); third (III), fourth (IV), and fifth (V) antennal segment; basal part of antennal segment VI (bVI) and processus terminalis (PrT); siphunculus (LSI); siphuncular width (WSI); last rostral segment (LRS); second joint of hind tarsus (IIHT); hind femur (HF); and cauda (CA). Descriptive statistics were carried out.





### Results

*Idiopterus nephrelepidis* was first detected in Bulgaria in a private greenhouse in Sofia on 13.03.2009 on *Nephrolepis exaltata* (L.) Schott. and on 13.07.2009 in a greenhouse in Varna on *Asplenium nidus* L. Both plants were imported from the Netherlands. Dense colonies of apterous females and larvae were observed on the youngest and most tender leaves. In the habitat in Varna, single specimens were also found on *Platycerium bifurcatum* (Cav.) C. Chr. In 2010 the species was also detected at two more locations in Sofia – on August 6<sup>th</sup> in a private greenhouse on *Nephrolepis exaltata* and on November 11<sup>th</sup> in a garden center for ornamental plants on *Pteris cretica* L.

Apterous viviparous females (Fig. 1) are black in colour, with pale antennae, legs and dorsal hairs. The first two antennal segments, the cauda and the basal part of the siphunculi are dark. The brief description below follows Heie (1994). Morphometric data of the main features (Table 1) are included. Body length 1 - 1.3 mm. Antennae six segmented, longer than body. Usually 2 - 3 rhinaria on proximal half of III. PrT 3.9 - 5.3 x bIV, longer than III. Head with small spinules. Antennal tubercles well developed, with almost parallel inner sides. LRS 1.7 - 2.4 x IIHT, with 6 accessory hairs. Dorsal abdominal cuticle is wrinkled, with indistinct reticulation formed by small spinules. Dorsal hairs with fanshaped apices, arising from tuberculate bases. Siphunculi cylindrical, with flange. SI 1.7 - 2.5 x CA. Cauda is triangular, slightly constricted in the middle, with 5 hairs.



Fig. 1. Apterous viviparous female of Idiopterus nephrelepidis.



	Min	Max	Mean	Std. error	Std. Dev.	cv
LB	0.980	1.340	1.177	0.019	0.088	7.5
WB	0.580	0.770	0.659	0.012	0.062	9.3
III	0.290	0.450	0.353	0.005	0.034	9.6
IV	0.195	0.310	0.242	0.004	0.026	10.9
v	0.200	0.330	0.253	0.004	0.028	11.0
bVI	0.105	0.150	0.120	0.001	0.010	8.2
PrT	0.470	0.610	0.543	0.005	0.035	6.4
LSI	0.230	0.320	0.272	0.003	0.023	8.4
WSI	0.048	0.083	0.068	0.001	0.007	10.3
LRS	0.117	0.140	0.129	0.001	0.006	4.5
IIHT	0.055	0.073	0.067	0.001	0.004	5.9
HF	0.420	0.630	0.507	0.007	0.048	9.5
CA	0.100	0.158	0.133	0.003	0.014	10.5

**Table 1.** Base sample statistics of the metric characters of apterae.

#### Disscusion

Idiopterus nephrelipidis is considered to be of Neotropic origin (Holman 1974). Currently it is widespread. In Europe it has been detected in Denmark (Heie 1994), Switzerland (Wittenberg 2005), the Czech Republic (Šefrová & Laštůvka 2005), Spain (Hidalgo *et al.* 2001), Portugal (Pita & Ilharco 2004), and others. *I. nephrelipidis* has also been reported from neighboring countries of Bulgaria - Macedonia (Steffan 1962) and Greece (Tsitsipis *et al.* 2007). In North and Central Europe, the species is restricted to greenhouses only (Heie, 1994). In southern regions and warmer climates the species can breed in the wild.

The host plants are many fern species (Blackman & Eastop 2006, Holman 2009). Among them, species native to Bulgaria are Adiantum capillus-veneris L., Asplenium adiantum-nigum L., A. ceterach L., A. scolopendrium L., A. trichomanes L., Gymnocarpium dryopteris (L.) Newm., Pteridium aquilinum (L.) Kuhn. Taking into account the presence of host plants of *I. nephrelepidis* in Bulgaria which are native to the local flora and the reports of the aphid from the Balkan area, it may spread in the country outdoors.

The species is entirely anholocyclic. Both apterous and alate females which are reproducing parthenogenetically, are known. In an experiment, aphids were reared under laboratory conditions on *Asplenium nidus* L. for four months. No winged aphids were observed.

The conditions in greenhouses are favourable for the development of the aphids and they form dense colonies. The damages caused by *I. nephrelipidis* result in leaf deformation and wilting, slower growth and even death of the infested fern. The species is also shown to be a vector of certain plant pathogenic viruses, such as Alfalfa Mosaic Virus, and Beet Mosaic Virus, (Edwardson & Christie 1991).



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