



PEST THRIPS OF BULGARIA



Gerald Moritz¹, Vladimir Krumov² and Olia Karadjova²

¹Martin-Luther-University Halle-Wittenberg, Halle, Germany, e-mail: gerald.moritz@zoologie.uni-halle.de

²Plant Protection Institute, Kostinbrod, Bulgaria

INTRODUCTION:

Thrips are among the most damaging insect pests on tomatoes, cucumbers, onions, tobacco, cereals and ornamentals, causing considerable economic losses in Bulgaria. Besides direct damage, caused by feeding, thrips also cause far more serious indirect damages through transmitting plant viruses – agents of diseases, against which there is currently no effective control. An early species determination is necessary to avoid yield losses.

Dichotomous identification keys require good systematic training. The lack of taxonomists brings the need of development of user-friendly identification software that can be used by anyone – from quarantine workers and economic entomologists, to the virologists and ecologists concerned with crops.



Fig.1 Start screen of Pest thrips of Bulgaria

METHODS:

The molecular key is based on the amplification of ribosomal ITS1 and ITS2 regions and restriction fragment length polymorphism (ITS-RFLP). DNA extraction is followed by a PCR reaction with either of 4 pairs of primers. Five restriction enzymes are used to cut the PCR product. The key first considers the PCR product's size in relation to the primer pair that was used. After input of the PCR product size, the characteristic patterns of RFLP gels are used to identify the investigated species.

The Lucid 3 software application, specifically designed for identification and diagnostic purposes was used for development of the key. The large number of functions incorporated in the software and the ability to include multi-media makes the creation and use of identification and diagnostic keys easy and effective.

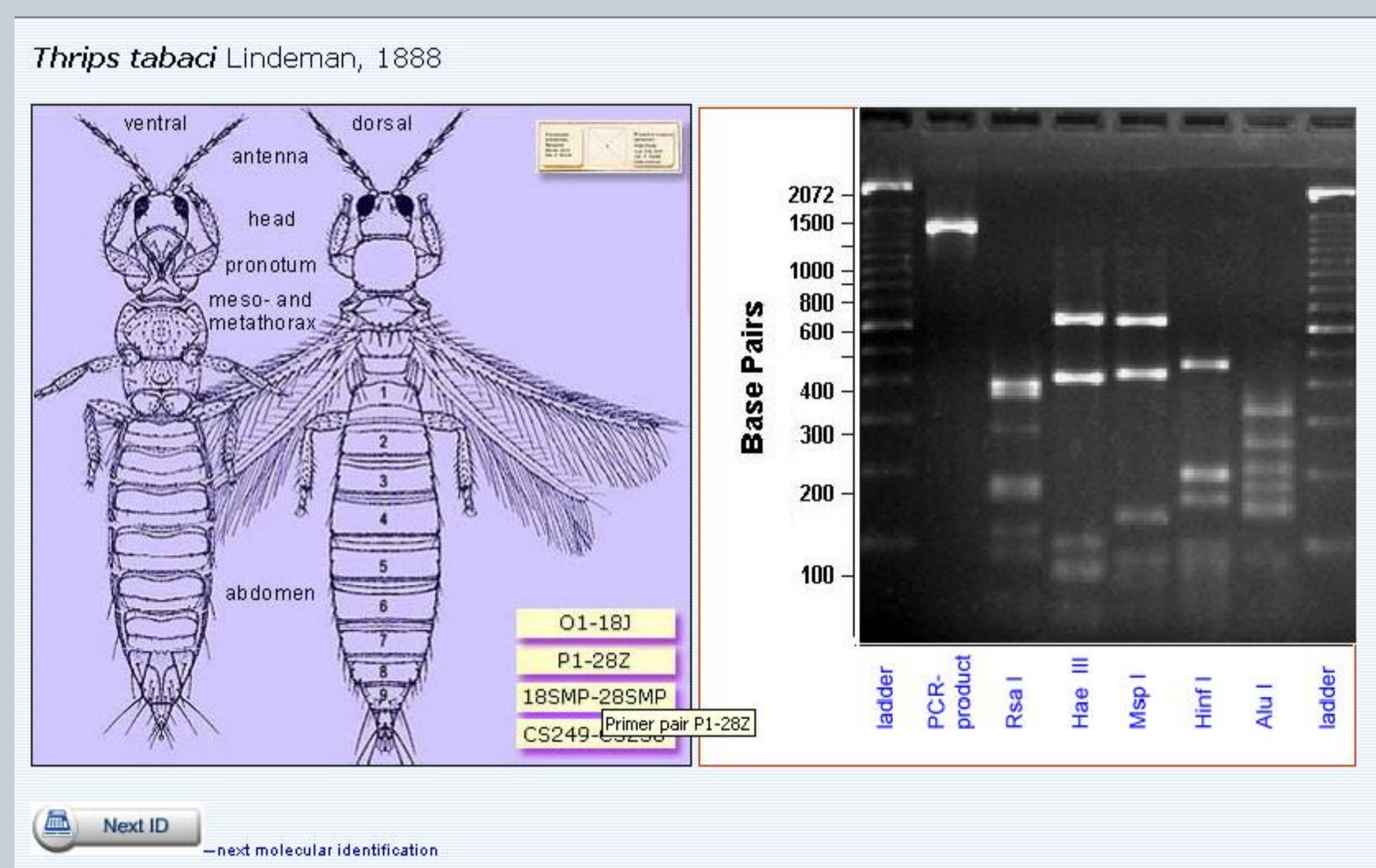


Fig. 2 Molecular data screen

Light microscope images were acquired using Syncroscopy Auto-Montage program through processing series of captured frames and producing a high quality focused image.

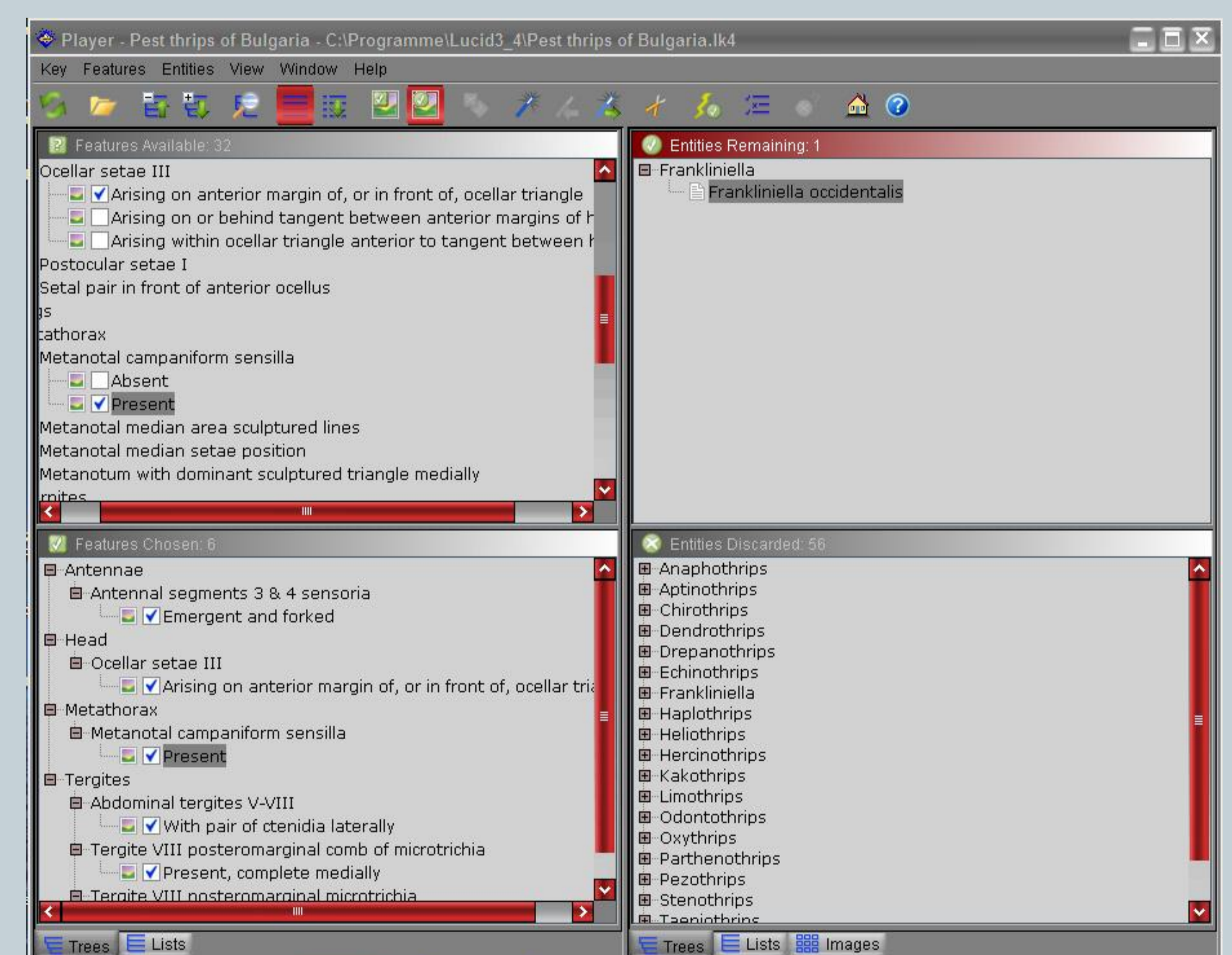


Fig.4 The main window is split in 4 small windows: Features Available, Features Chosen, Entities Remaining and Entities Discarded

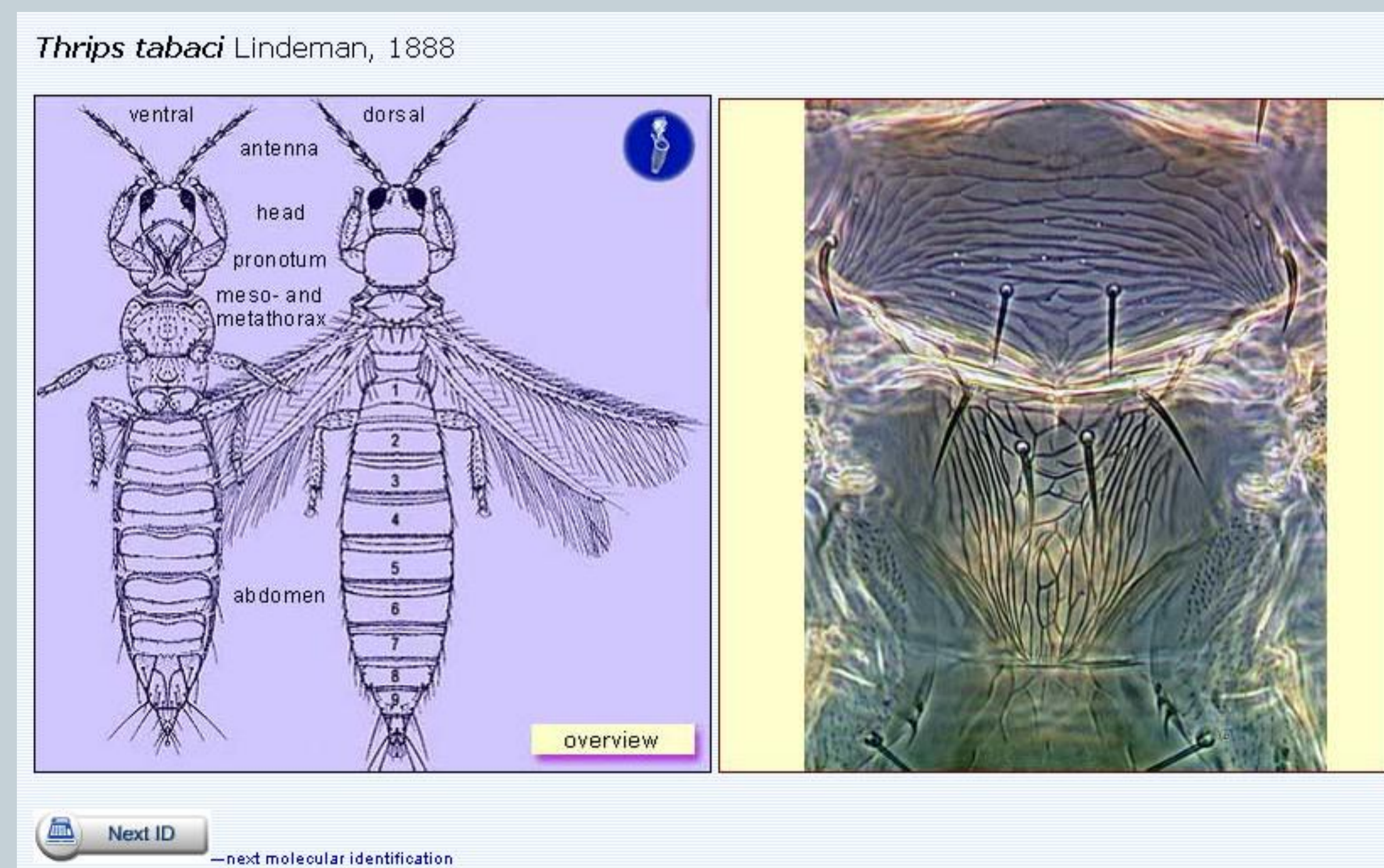


Fig. 3 Visual data screen

RESULTS:

The interactive key of Pest thrips of Bulgaria is designed to combine molecular and morphological features for identification. Besides the available identification tools the CD includes useful information on the methods used, general data on thrips, their biology, distribution and host-plants. The software is available in 3 languages – Bulgarian, English and Russian.

CONCLUSIONS:

- The Pest thrips of Bulgaria interactive key allows fast and reliable diagnostics of all life stages that can be performed even by non-specialists in thrips taxonomy.
- An important future perspective is the development of a key to thrips species on a broader scale covering the thrips biodiversity of the Mediterranean countries and the Balkan Peninsula.