Scanning electron microscopy (SEM) is popular and for taxonomy of parasites very important and not substituted method in many times. However, sometimes taxonomists have only one specimen and cannot use classical SEM, because their sample (poor conductor) have to be fixed, dehydrated and coated before it can be observed. This method condemns samples for destroying and do not allow other using of it, e.g. for molecular study or depositing as type material in museum. Moreover, the specimen preparation is often long and slow. Environmental scanning electron microscopy (ESEM) brings two main advantages: elimination of speed of sample preparation and non-invasivity.

We have made ESEM observation on several groups of already fixed parasites in 4% formaldehyde solution or 70% ethanol: crustacean (*Ergasilus* sp.), nematode (*Contracaecum osculatum*) and others. Observations were made with the experimental environmental ESEM AQUASEM-II redesigned in the Institute of Scientific Instruments of the Academy of Sciences of the Czech Republic by Ionization and YAG-BSE detectors. The samples were cooled down to 2°C and observed in an high pressure water vapour environment of 650–700 Pa. Samples were placed on a Peltier cooled specimen holder to a drop of water. Consequently the water was slowly evaporated from the sample, see Fig. 1.

Combination of SEM and ESEM techniques brought two slightly different views. Conventional SEM has better contrast, more details in microstructure and resolution, however in specific case, for example at nematodes; it is ESEM almost comparable with SEM. In this study, we showed that ESEM allows the examination of specimens at high pressure conditions without any previous treatment in fully hydrated state and can be used effectively in taxonomical studies of the parasites, where valuable unique specimens sometimes exist.

Acknowledgement: This study was supported by the Department of Botany and Zoology, Faculty of Science, Masaryk University, and by projects No. P505/12/G112 and No. GA 14-22777S.
Fig. 1: Sequential drying of Contracaecum osculatum specimen documented by ESEM AQUSEMII. Scale bars: 100 µm. Observation parameters were: cooling temperature 2°C, pressure of water vapour 680 Pa, distance between the sample surface and the second pressure limiting aperture 2.7 mm, accelerating voltage 20 kV and probe current 95 pA.