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Prospects of using Black Soldier Fly in biotechnology

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Aim of the study: Nowadays biotechnology as science upcoming trend associated with living organisms cultivation for industrial purposes, is of great ecological and biological value. American fly species – Black Soldier Fly (Hermetia illucens) – is an object of the research. The species inhabits countries with warm climate although recently the breeding of the insect in cold regions with climate has been actively discussed. The insects belong to invertebrate species able to grow in pure culture in a closed space of artificial conditions whole-year enabling to be used for biotechnological purposes. Study objective is determining prospects of using Black Soldier Fly in Arkhangelsk region's biotechnology spheres.

Material and Methods: Bioconversion process by Fly's larvae is considered as general biotechnology direction. The species is used for problematic wastes stabilization including pigs and poultry's manure and organic portion of solid biological components, wastes from fish and meat processing; fruits, vegetables, restaurant and kitchen wastes. Thus, larvae's body builds up complex of macro- and microelements, whose percentage depends on diets. It leads to increasing larvae nutrition and using it as food additive for cattle and poultry (protein and fats content ≈40%). Unlike America and Europe where Fly breeding on an industrial scale in cold climates have been conducted for decades, it has been poorly studied in Russia. In Russia's Northern latitudes studies were conducted only in Arkhangelsk region since 2015 on the basis of LLC "NordTechSad". Research focuses on larvae's and prepupas' biomass producing for introduction in food of agricultural animals and fish as protein and energy food component, and to replace fish meal. Stated list of fly's application is not comprehensive.North American fly can serve as a source of chitin and chitosan. Work on production of polysaccharides is held at Biology, Ecology and Biotechnology Department of NARFU (Arkhangelsk). Previous studies revealed high content of chitin in dead flies - 26%.

Results: Black Soldier Fly is an insect arousing great scientific and practical interest.It has approved itself as a food additive for agricultural animals and aquaculture along with the bioconversion ability enabling to determine ecological focus on improving environmental Arkhangelsk region' condition. Using flies as a source of chitin and chitosan is a new direction in biotechnology, ecology and medicine in the region. Flies breeding in artificially created conditions on the basis of the small innovative business LLC "NordTechSad" and conducting tests of adding larvae as a food additive to animals' meal will ensure development of agricultural and food industry in the region.

Keywords: Black Soldier Fly, bioconversion, food additive, chitin, chitosan.