Nitrate of 2,6-diacetylpyridine-bis(picolinoylhydrazone)-bis(aqua)iron(III)–hydrate(1/2,5) with stimulating properties on exocellular lipase synthesis for the *Rhizopus arrhizus* CNMN FD 03 fungal strain and nutrient medium for cultivation

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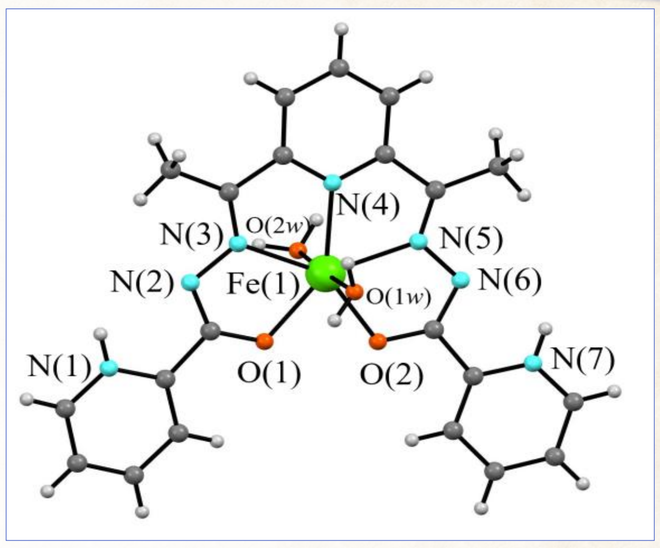
Coordination compounds derived from 2,6-diacetylpyridine (*dap*) hydrazones and transition metal ions have yielded a surprisingly rich chemistry. The *dap* ligands, due to their multicoordination sites, are capable of efficiently stabilizing the metal center by forming unique geometries.

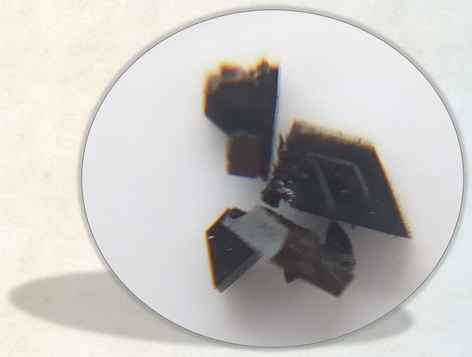
As a result of interaction $Fe(NO_3)_3 \cdot 9H_2O$ with 2,6-diacetylpyridine bis(picolinoylhydrazone) (H_2L) (molar ratio of 1:1) in methanol under refluxing (4 h), mononuclear coordination compound ***$[Fe(H_2L)(H_2O)_2](NO_3)_3 \cdot 2{,}5H_2O$*** was synthesized.

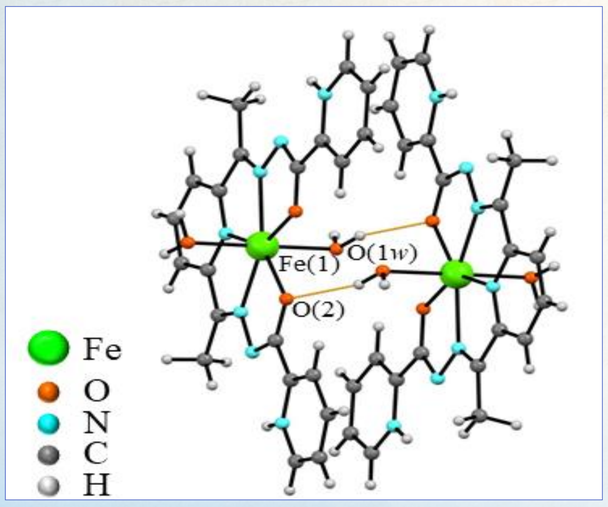
The coordination polyhedron of the metal cation represents pentagonal bipyramid formed by N_3O_4 set of donor atoms going from the pentadentate Schiff base ligand and two oxygen atoms of the coordinated H_2O molecules.

FeN_3O_4

Fe(1)–N(3) = 2,186(2) Å; Fe(1)–O(1) = 2,0717(19) Å;
Fe(1)–N(4) = 2,196(2) Å; Fe(1)–O(2) = 2,0842(19) Å;
Fe(1)–N(5) = 2,185(2) Å; Fe(1)–O(1*w*) = 1,9979(19) Å;
Fe(1)–O(2*w*) = 2,0393(19) Å.



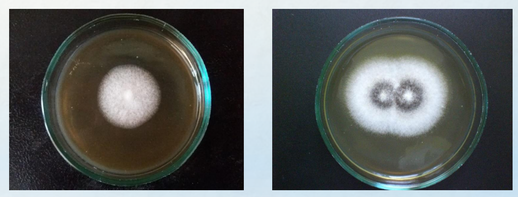


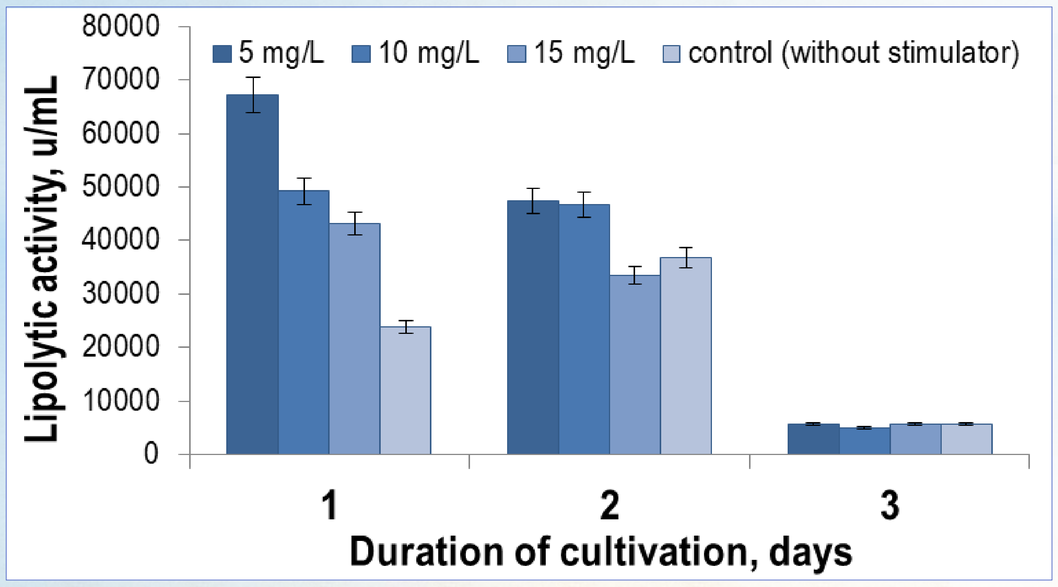


The compound $[Fe(H_2L)(H_2O)_2](NO_3)_3 \cdot 2{,}5H_2O$ was investigated by X-ray diffraction. It was established, that crystals consists from complex mononuclear cations $[Fe(H_2L)(H_2O)_2]^{3+}$, NO_3^- anions and solvated water molecules.

The complex is highly soluble in water, which ensures a practical use as a component of nutrient mediums.

***Rhizopus arrhizus* CNMN FD 03**





ADVANTAGE

The addition of coordination compound $[Fe(H_2L)(H_2O)_2](NO_3)_3 \cdot 2{,}5H_2O$ to the nutrient medium of *Rhizopus arrhizus* CNMN FD 03 fungal strain, in concentration of 5,0…15,0 mg/L increases biosynthesis of lipases with 17,4 – 82,7%, depending on the concentration and reduces the producer`s cycle of cultivation by 24 h. Thus, the highest values of lipase activity were found at the first day of growth, while in the control (without stimulator) the maxim of activity was revealed on the second day. The most effective concentration for enzyme production was 5,0 mg/L.

APPLICATION

Industrial microbiology

Acknowledgment

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